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OF THE

ROYAL ASIATIC SOCIETY.

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JANUARY, 1851.

ART. I.—*Account of the great Hindu Monarch, Aso'ka, chiefly from the Indische Alterthumskunde of Professor Christian Lassen.* BY THE HON'BLE SIR ERSKINE PERRY.

The Mussulmans of India may justly boast in Akbar of one of the greatest sovereigns whom the world has seen. Nearly a contemporary of three very celebrated Monarchs in Europe, the crafty and superstitious Charles V., the sensual and unprincipled Henry VIII., the libertine Francis I., sink into common place individuals when placed in comparison with the great Mussulman Emperor. Pre-eminent for genius in war, some of his movements recall to mind the most celebrated exploits of Alexander or Napoleon. His rapid march, for example, from Agra to Ahmedabad after the rains had commenced, when to quell an insurrection in his recent conquest of Gujerath, he placed himself at the head of his body guard, and, almost without drawing bit, reached the capital, 450 miles distant, in nine days, where by his unexpected presence he at once restored good order, is one of he most memorable feats in Indian History.

But in Civil Government he was still more distinguished, and his policy to consolidate a grand Indian Empire by a fusion of races and equal treatment of religions, bears all the marks of a great original idea. The *Ayin Akbari* is a splendid memorial of the prosperous state of Akbar's government, and the world probably never beheld a more brilliant court than that of Agra, where the 'barbaric pearl and gold' of the gorgeous East were subordinated to the exquisite taste and high intelligence, which the architecture of that period still betokens, and traces of which are still clearly perceptible in the dignified bearing and high polish to be met with even in the pettiest Mahomedan Durbar of the present day.

But a still higher phase of Akbar's character remains to be mentioned. Conquerors but too often employ their energy of soul for mere personal ambition, and self-aggrandizement; statesmen in their intercourse with the world are frequently seen to contract a contempt for their fellow-men, and to become hard and cynical. If, however, we follow Akbar into private life we find that our admiration of the Monarch is exceeded by our love for the man. His philosophic speculations with the choice spirits whom he attracted to his court, remind the reader of the learned leisure of the Antonines, but his delicate treatment of the high born Rajput, who, for the first time subdued in arms, was forced to bend the knee as a subject at his throne, displays a soul of chivalry of which even Bayard might have been proud. If Akbar in short had been a European, we might have summed up his character by stating that he possessed all the great qualities of a Conqueror, a Christian, a Philosopher, and a Gentleman.

It is impossible that the race who claims so great a man can, fail to feel ennobled when dwelling on his story. But there is reason to believe that the Hindus can also bring forward a Monarch of equally extended empire, and on whom none of the eulogiums which have been bestowed upon Akbar, would be exaggerated. It is remarkable that an English reader of History is unable to obtain any authentic account of *Asóka*, or *Dharmasóka* as he is frequently called. He was apparently unknown to Sir William Jones; even so late as 1836, James Prinsep when on the eve of his brilliant discoveries, consider-

ed him an "ideal personage;" *(a)* Professor Horace Wilson in the year of Grace 1849, would seem to cling to the idea, that his is only "the shadow of a name;" Mr. Elphinstone despatches him in a few sentences; and other historians make no mention of him.

And yet the materials exist for a more full and accurate history of *Asóka* than of any Hindu king who ever reigned *(b)*. I trust therefore that whilst spending a few days vacation in a purely Hindu district *(c.)* where the name of the great Hindu Sovereign is still preserved, and where a beautiful grove on an adjoining hill of Asok Trees *(Jonesia Asóka)* attracts a pious crowd once a year, when according to Sir William Jones, "the vegetable world scarcely exhibits a richer sight than an *Asóca* tree in full bloom," (*d*). I say, I trust that I may employ my time profitably by presenting in an English dress what the great oriental scholars of Europe, Lassen, Burnouf and Ritter (but principally the former) have worked out for us from the literature of the East, and from the raw materials collected by our countrymen in India.

An authentic chapter of ancient Indian history upwards of 2,000 years old, can scarcely fail to be interesting to the English reader in this country, whether he be the hard worked official, whose important duties in the administration of government leave him but little time

(a.) Jour. of Beng. A. S. Vol. v. p. 523.

(b.) It is gratifying to national pride to think that in the three great achievements of modern scholarship in this century, the decypherment of hieroglyphics, of wedge-formed characters, and of the Lath inscriptions, the names of our countrymen Young, Prinsep and Rawlinson should stand forth so pre-eminent, and although Dr. Young was subsequently eclipsed by the more extended discoveries of Champollion, the glory belonging to the former two, and especially to Prinsep, is shared by none.

(c) Angria's Colaba, though forming the southern headlands of the harbour of Bombay, was almost a *terra incognita* to Europeans, till its escheat to the British Government in 1840, and even now is but little visited.

(d) It would be gratifying to think that the lovely shrub, which is known by this name as well in swampy Bengal as in the wild jungles of the Bombay Concan, is indebted for it to pious Buddhists, who thus strove to embalm the memory of their great Monarch; and the finding it in the neighbourhood of Buddhist Caves, such as Kenari and Carli, cherishes this notion; but I learn from Dr. Wilson, that the Asóka tree is mentioned in the Ramayána, the bulk of which is set down by the best Sanscrit scholars as anterior to Buddha.

for the comparatively trifling pursuits of philology and antiquities, or whether the inquiring Native student, who may be surprised to find that the most accurate accounts of the good old times of his own country are to be obtained through the literature of Europe.

Haply also, the European statesman, amid all the civilization of the nineteenth century, but with the same, perhaps even exaggerated, social evils pressing upon his attention, which engaged the benevolent *Asóka*, may pick up one or two hints for good government from the enlightened despotism of India twenty-one centuries ago. The genial climate of tropical Asia, its fertile soil, the simple wants of its inhabitants, and the absence of any densely peopled manufacturing districts, may render it more easy for an Indian Sovereign to contribute by slight acts of beneficence to the happiness of his people than it would be for a Government in Europe; yet some of the Hindu institutions, the wayside well and avenue, the groves of mango, and other fruit trees, sometimes extending for miles *(a.)* the Dharmsála or carravanserai for poor travellers, seem capable of a worldwide application, and their universal appearance in all Hindu States is a most gratifying recognition of the claims of the poorer classes of society by the rich and powerful.

The grandfather of *Asóka* was *Chandragupta* who, by a happy divination of Sir W. Jones, once much doubted but fully established by modern scholarship, is clearly identified with the Sandracottus of the Greeks. From native records but still more from the testimony of the Greek historians and ambassadors, we are enabled to obtain a tolerably clear view of this founder of the Maurya Dynasty. *Chandragupta's* birth and origin are uncertain ; Buddhist accounts make him out to be of royal descent, and of the family of the *Sakyás* to which Buddha himself belonged, but the fact of his having founded an empire and of his grandson *Asóka* having made a still more powerful impression on the Asiatic mind by his conversion to Buddhism, and by his successful exertions to propagate his new faith, would readily account for the royal genealogy afterwards attributed to the founder of

(a.) One such tope of mango trees I saw near Goruckpur, extending for at least three miles.

the race. In a Sanscrit play *(a.)* which has for its hero the Bramin minister of *Chandragupta,* the latter is mentioned as a *Vrishala* or *Súdra,* though he is also called a scion of the previous Nanda dynasty which he had deposed; but Lassen, on a comparison of all the authorities, feels no doubt that he was a man of low cast, though, with our knowledge of royal dynasties in India, this fact does not appear conclusively to decide that his family had not previously been seated on a throne.

On the invasion of India by Alexander, he appears to have served as a young man in the opposing forces, and there seems little reason for doubting that Justin *(b.)* contains a portion of true history, when he describes *Chandragupta* as the leader of the successful insurrection which drove the successors of Alexander out of the Punjab. But he observes that he made use of the victory to convert the liberty so acquired for his fellow countrymen into a despotism for himself..... "titulum libertatis, post victoriam, in servitutem verterat, siquidem occupato regno populum, quem ab externá dominatione vindicaverat ipse servitio premebat."

It is probable that at this period he obtained for himself the kingdoms of Porus and Taxiles in the Punjab, and the intrigues of a Bramin named *Chanakia* are mentioned as having been very serviceable to him in placing him on the *gádi.* He extended his possessions rapidly to the eastward, and soon afterwards succeeded in ejecting from his capital of Pataliputra, (the Palibrothra of the Greeks) *(c.)* the powerful monarch of the Prasü whom the Buddhist writers call *Dhána Nanda,* or the Nanda of wealth; but the historians of Alexander, Xandrames, the similarity of which name to the Sanscrit Xandramas (moon) is pointed out by Lassen.

It would appear that this latter victory was not obtained without

(a.) Mudrâ Raxava. 2. Wilson's Hindu Theatre.

(b.) L. xv. 4.

(c.) The site of this town seems now to have been clearly made out by Schlegel to be on the Ganges at the confluence of the Soane, and near the more modern Patna; see Ritter's Asien, V. 508; the Chinese traveller Hiun Thsan'g whom Klaproth has translated, describes the city as still flourishing, A. D. 650.

difficulty or the new kingdom enjoyed without opposition, for the Bramin minister of the ejected Nanda dynasty seems to have succeeded in forming a powerful confederacy composed of five independent Indian Rajahs, and the great king of the *Mlechas* or *Parasikas* (Parsis) who can be no other than Seleucus, the then reigning Prince of Persia. The wily Bramin *Chánakia*, however, was at hand to defeat this powerful coalition which sought to reinstate the heir of the Nandas on the throne of *Pataliputra*, for by sowing jealousies amongst them he contrived to break up their force, and *Chandragupta* from that time enjoyed the throne undisturbedly and was able to extend his rule far and wide. Lassen thinks that he even met Seleucus himself successfully in the field, and that the fact mentioned by the Greeks of the latter having exchanged the provinces of Gedrosia, Arachosia, and Paropamisus with *Chandragupta* for five hundred elephants, is only to be explained on the assumption of a successful campaign on the part of the latter against the Greeks.

From this period, however, it is clear than the relations between Seleucus and *Chandragupta* became most intimate. They interchanged presents and the celebrated Megasthenes was sent to Palibrotha as the Greek ambassador, the exact date of which important occurrence does not appear, but it was previous to the year 280 B. C. as in that year Seleucus died. If the work of Megasthenes on India had come down to us, it would have been the most important gift to the oriental Scholar, Antiquary, and Statesman, that antiquity could have bequeathed; for it would have displayed an authentic picture of the greatest Hindu Monarchy which had existed up to that time by a European Scholar of the age of Aristotle, and one apparently gifted with every endowment for truthful and philosophic narration. As it is, the industry of learned Germans of our day has collected a mass of accurate information respecting the India of that period, which is nearly all traceable to Megasthenes. *(a.)*

The extent of the kingdom which *Chandragupta* carved out for himself, can be ascertained much more accurately from Greek than

(a) See Scwanbeck; and E. Müller's, Fragmenta Historicorum Græcorum.

from Hindu authorities. The latter only inform us that he reigned at *Pátaliputra*, and that he subjected the peninsula of Kattyawar to his rule. From the former we gather that his empire extended to the Indus on the one hand, to the mouths of the Ganges on the other, and to the south was only bounded by the Vindhyan range. Ougein in Malwa was therefore within the limits of his empire, and he placed his grandson *Asóka* in that province as his Lieutenant. He appears to have acquired Gujerath by conquest in the latter period of his reign, but the wild country bordering the Aravulli range, now held by the Rajputs, and never fully conquered till the time of the great Akbar, does not seem to have acknowledged his sway. If then the expression of Plutarch that he conquered the whole of India, be an exaggeration, there can be no doubt that he founded a mighty empire, and all the accounts are unanimous as to the overwhelming force he was able to maintain in arms. (*a.*) *Chandragupta* reigned for four and twenty years, and died 291 B. C. He was succeeded by his son *Vindusára*, of whom we know but little. *Daimachos* was sent to him as ambassador by *Antiochus Soter*, and the Greeks who do not mention him by his proper name, but under another title *Amitochates* or *Amitraghâta* (Slayer of the enemy), state that he requested *Antiochus* to buy for him some sweet wine, some figs, and a Sophist versed in the Greek philosophy. The Greek Monarch sent him the wine and the figs, but remarked that it was not usual among the Greeks to sell philosophers. Upon which Lassen remarks that as such also was not the custom amongst Hindus, the latter part of the story was probably a flourish for Greek glorification.

During the reign of this Monarch, relations were also entered into with the Greek rulers of Egypt, and Ptolemy Philadelphus sent to him *Dionysius* as his Envoy.

Vindusára is said to have had sixteen wives, and a hundred and one sons, of whom *Asóka* and *Tishya* were born of the same mother.

Asóka was sent during his father's lifetime to quell a serious insurrection which had broken out at *Taxasila* in the Punjab. On ap-

(*a.*) Strabo xv. 1, 53. Pli. H. N. vi. 22, 5.

proaching the city the inhabitants came out to meet him, and assured him that they were not enleagued against the Maha-Rajah but against his minister who had been oppressing them, whereupon *Asóka* made a grand peaceable entry into the town. He subsequently conquered the adjoining territory of the *Khásas*, who cannot be the people of that name in the North (Kashgar), but were probably a colony planted by the latter in the neighbourhood of the Indus.

At a later period *Asóka* was sent by *Vindusára* to *Ougein* to take charge of the province now called Malwa; the reason assigned for which move is that he had been discovered plotting against his father's life, who thereupon took steps to remove the dangerous intriguer from his capital. According to another account, *Vindusâra* destined the throne for his son *Susíma*, whom a short time before his death he had sent to *Taxasila*, which had again revolted. When *Asóka* heard shortly afterwards of his father being on his deathbed, he posted without delay from *Ougein* to *Pátaliputra*, where he made himself master of the government, and put all his brothers to death with the exception of *Tishya*. It is to be hoped that this general massacre is a calumniating invention of the Bramins, although we find it narrated in the *Mahawanso*, p. 21.

If *Chandragupta* holds a distinguished place in ancient Indian history from his having established the greatest Indian empire which the world had then seen, his grandson *Asóka* shines forth much more prominently from his having been the monarch to propagate Buddhism with such wonderful ardor, and still more from his being the first Prince of whom we possess undoubted historical records in his own language. As his history is derived in great part from the inscriptions left by him, it may be useful to give a short sketch of the character and discovery of these monuments.

These inscriptions are to be found on columns, and on rocks. The latter are to be met with at *Girnar* in Kattyawar, at *Dhauli* in *Orissa*, and at *Kapur-di-giri* near Peshâwar. But as the former were the earliest made known to us, it will be well to describe them first.

The Delhi column, was the first of which notice was given to the world. It is situated near the banks of the Jumna within the old wall

of the city to the N. W., and is called the Láth, or pillar, of Firuz-Shah, because it stands in a palace erected by that Emperor; but whence he obtained it is unknown. The second is at Allahabad, and equally betokens the dominion of the Mussulmans, as it presents an inscription of the Emperor *Jihángír*, who on mounting the throne in 1605, caused it to be again erected. It had been pulled down by the previous fanatical Mahomedan rulers of India, as a monument of superstition, about the middle of the fourteenth century; and at an earlier period it must also have been prostrated for some reason or other not now ascertainable, as we find on it an inscription of the Rajah *Samudragûpta* who reigned in the fourth century after Christ, and who must have again erected the column, as inscriptions are to be found upon it which could not have been carved whilst the column was standing, and which are of a later date than the inscription of *Asóka*. This remarkable pillar maintained its old position in the fort built by Akbar, and *Jihángír* until the year 1799, when the English officer in charge who was making alterations in the fortress allowed it to be pulled down. (*a.*)

A third column is still standing on the spot where it was originally erected at Bakhra, on the road from Patna to Kajipur; it has no inscription, but is otherwise uninjured. The same part of India contains two other pillars with inscriptions, one at Matthiah in the Rajah of Bettiah's district; and one at Rádhia, near the Nepal frontier to the east of the Gandak. From so many columns being found in one neighbourhood it is easy to believe the accounts which have been handed down that *Asóka* erected very many of them throughout his territories.

They appear to have been all alike both in size and ornament, and are all of the same material, a red sandstone. Their height was a little more than 40 (French ?) feet, their circumference at the base 10, and below the capital 6 feet. The latter was ornamented with a chaplet of lotus flowers, and was surmounted by an abacus on which was a couching lion; including the lion, the capital was

(*a.*) J. of As. S. of Bengal. iii. p. 106; iv. p. 127. vi. p. 786.

6 feet in height. The lion has a clear reference to the name of Buddha, *Súkyasinha*, (The lion of the Sakyas); such pillars therefore were called *Sinhastambha*, Lion-pillars. *Asóka* himself terms them *Silastambha*, virtue-pillars, because he had engraved upon them his laws, and exhortations to good conduct. On this account they are also called *Dharmastambha*.

The inscription which is to be found of identical import on all four columns is divided into four parts, directed to each quarter of the heavens. On the Delhi column another inscription is found running round the pillar beneath the others, and an addition is also found to the inscription on the east face, which is wanting in the others. The Allahabad column has also got a special inscription of four lines.

The oldest of these inscriptions is dated in the twelfth year after the Maha-Rajah's coronation, the remainder in the six and twentieth year.

The second class of inscriptions which are engraved on the rock are to be found on the west, the northwest, and the east side of India. Those on the west are below the hill of Girnar, in the Kattyawar Peninsula, near Junaghur, whose old name *Javánagada* marks it out as a seat of ancient Greek dominion. They are found on a projecting block of granite, three sides of which are covered with inscriptions; the easterly one belongs to *Asóka*, the westerly to the king and great Satrap *Rudradáman*, the northerly to *Skandagúpta*.

The first, which alone concerns us now, is divided by lines into fourteen edicts which are so placed that the first six follow each other to the left, the second to the right, and the thirteenth and fourteenth are beneath the latter. *(a.)* The fourth edict dates from the 12th year after the Rajah's coronation. The third mentions a Regulation of the same year, which was, probably, then also promulgated. The eighth edict refers to an occurrence in the tenth year, but which doubtless had not been published till a later period. In the fifth edict

(a.) See 12. As. Jour. p. 153. where a lithograph of the inscription and a most valuable critical revision of the text in Roman characters by Professor H. H. Wilson, are to be found.

a general order of the 13th year is to be found. The conclusion contains no date, but from the above premises we may collect that the whole inscription was not engraved until after the 13th year.

The inscriptions of *Asóka* next to be mentioned were discovered near *Bhuvaneswara* the old capital of Orissa, on one of three low rocks called *Asvastama* near the village of *Dhauli.* The first ten edicts, and the fourteenth, correspond in meaning entirely with the preceding, but the language is somewhat different, though it is not a translation, but a repetition of the same ideas with slightly varying phraseology. There occur here also two special inscriptions not found elsewhere. These inscriptions contain no date, but the third and fourth belong to the 12th year after the coronation like the corresponding ones in Girnar.

The third edition of this inscription is in the Arian character, and is to be found on a block of stone standing on a rock near the village *Kàpur-di-Giri,* which is situated on the small rivulet *Kálapáni,* a day's journey to the N. of the Cabul river. The inscription on the northern side corresponds with the first eleven edicts of Gírnar, that on the southern side with the three remaining ones. This inscription also is no translation of either of the two others, but about half of it corresponds in words with the Girnar inscription; the second edict is shorter, the sixth on the contrary much longer; the ninth differs greatly from the two others, the three last edicts are also much more full than those at Girnar.

It appears from *Asóka's* own words that he caused these inscriptions to be engraved in many other places. He not only published inscriptions of different import, but he caused the same inscription to be set up in different forms, at full length, abridged, and in a form between the two others; *(a.)* they were repeated thus often on account of the beauty of their contents, which it was desirable that the people should become acquainted with.

These inscriptions possess the inestimable value of giving us the

(a.) The Girnar inscription XIV, states. "The god-beloved benevolent minded Maha-Rajah, has caused this Law to be engraved; it is (appears) with abbreviation, in a middle form, and expanded, but the whole never in any one place, confuses."

Rajah's own account in his own words of his actions and motives. They are also of the highest worth for a history of Indian languages, as they present us the oldest forms of the vernacular dialects in an authentic character, and afford a firm basis for the comparative grammar of the great, multifarious, and complicated, Sanscrit family of tongues. As an inquiry into this subject is foreign to the immediate object under discussion, and as one class of these inscriptions is still almost unknown, *(a.)* it may suffice to make one remark only, viz., that they afford us specimens of three popular languages; one on the north-west frontier, a second on the west, and a third on the east side of India; for although the Pillar-inscriptions differ in a few forms from those at *Dhauli*, they nevertheless belong on the whole to the same formation, and may be considered as the *Mâgadhî* of philologists. As this dialect is also used on the Delhi pillar, which is beyond the borders of *Mâgadhâ*, *Asóka* appears to have shown special favor to the vernacular tongue of his own capital, and from the prevailing usage of this affiliated form of Sanscrit, we may possibly explain why it is that the Singalese who derived their Buddhism from the same country, also term the sacred language of their books *Mâgadhî*, *(b.)* otherwise called *Pali*. The honor of having revealed to posterity the meaning of these inscriptions belongs to JAMES PRINSEP, who was the first to decipher the two alphabets in which they are written, and the first to publish and explain them. And, although on subsequent examination of the originals, a few corrections have been found necessary for several of his explanations, it must never be forgotten that he undertook this task without any special preparation in the studies connected with it, so that whoever looks upon his achievements from this point of view

(*a.*) Professor Lassen had not then seen the revised text of the *Kapur-di-Giri* inscription, 12 As. Jour. p. 152.

(*b.*) A bystander in the Supreme Court will also observe that the language of the Holy Books of the Jains, or Shrawaks, is *Mâgadhî* but we learn from the Rev. Dr. Stephenson's translation of the *Kalpa-Sutra* that the later writings of the Jains are in Sanscrit.

must acknowledge that they rank among those discoveries which mark a grand step forward in our inquiries into antiquity. *(a.)*

In these inscriptions *Asóka* does not mention himself by his own name, but by another, *Príyadarsin*, i. e., the benevolent-minded (according to Lassen, but the good-looking, or agreeable looking according to Horace Wilson), and to this name is prefixed the adjective, *Devánám priya* god-beloved.

Besides these inscriptions the writings of the Singalese Budhists form the principal source for our knowledge of *Asóka's* history. *(b.)*

In his youth he was appointed, as has been already stated, viceroy of *Avanti*, and resided at Ougein. On his journey there, he met at the town of *Kitiagiri* (which was probably in the Harowti range) with the beautiful daughter of a Seth or *Sréshtin (c.)* whom he married, and who bore him a son named *Mahindra*, and two years afterwards a daughter named *Sanghamitrâ*. *(d.)*

He was crowned at *Pataliputra* in the fourth year of his reign; and from this year which was 259 B. C. he dates not only his inscriptions, but other acts of his reign.

Asóka like his two predecessors belonged to the Braminical faith; his father used to feed sixty thousand bramins daily, and he himself during the first three years of his reign followed the same course. In the latter of these years he renounced his earlier faith, and became a convert to the doctrine of *Buddha. (e.)* The southern and northern

(a.) It is much to be regretted that the interesting papers of Mr. Prinsep on this subject tracing the steps of his discovery in the Bengal Asiatic Journal, should not have been collected and republished. The valuable work by Mr. Thoby Prinsep contains only the results of his brother's discoveries bearing on Bactrian and Indo-Scythian History.

(b.) In another part of his work Lassen gives a detailed account of the rich Buddhist literature of Ceylon.

(c.) Lassen explains this term to mean the head of a trade or guild Horace Wilson translates the term by the word Provost, 1 Hindu Theatre 16; and it seems probable that the city officer so well known in this part of India under the name of Nagar-sêth is the modern representation of the ancient Sresti, or Srêshtin.

(d.) Mahawanso. c. XIII p. 76. *(e.)* Mahawanso. c. V.

Buddhists give entirely different account of his conversion. According to the former he was converted by his nephew *Nigrodha* the son of his eldest brother, whom he had murdered when he ascended the throne. But, if there is any truth in this tale, one portion of it is evidently incorrect, as *Nigrodha* at this period was only seven years old. After the latter had persuaded the Maha-Rajah to adopt the new doctrine, he converted the people also and confirmed them in the observation of the law. According to another version of the narrative *Asóka* appears to have become disgusted at the mode in which the bramins abused his generosity, and to have determined thereupon to examine the doctrines of other sects. *(a.)*

The northern Buddhists describe his conversion to have been effected by a miracle, and by another person named *Samûdra*, the son of a *behpari*, or merchant; the account therefore wants the characteristics of true history. *(b.)*

Even however if any real influence in *Asóka's* conversion can be ascribed to *Nigrodha* according to the former account, it must not be overlooked that the determination to give up the faith of his ancestors was chiefly caused by his own reflections on the superiority of Buddhist to Braminical doctrines. This clearly appears from his own words in which he contrasts the previous condition of things with those established by himself. Formerly, an immense number of animals were slaughtered at his palace for food. *(c.)* One of the fundamental laws of Buddhism, the *Ahinsa*, or non-destruction of living beings, was especially overlooked; and the disregard of Parents, of Bramins, and of Sramans had every where got the upper hand. *(d.)*

Since he had adopted the *Law*, this state of things had completely changed. *(e.)*

It was therefore the mildness of the new doctrine, the universal

(a.) Mahawanso. p. 23.

(b.) According to the Asóka-Avadâna (See Burnouf's Introduction a l'Historie du Buddhisme I. p. 365) Asóka at the commencement of his reign was a cruel tyrant, and was called in consequence Kandâsóka, Asóka the furious.

(c.) Girnar Inscr. I. 7. *(d.)* Girnar Inscr. IV. 1.

(e.) Ib. IV 5. 6. where it is added 'obedience is now also shown to Parents and Elders.'

respect for life enjoined by it, its prevailing tendency to promote human happiness and virtue, that determined him to adopt the *Law* of Buddha and to attempt it's propagation. He not only adopted it for himself, but required his sons, grandsons, and their successors to observe it. He points out compliance with the law as the best of all works, and endowments to it as the best of all gifts. (*a.*)

In reference also to the period of his conversion his own words are much more trustworthy than the accounts of a later period. He states that he only obtained complete insight into the truth in the 10th year after his coronation; from that period he renounced the usual amusements of royalty, and dedicated himself entirely to the performance of the duties enjoined upon monarchs by the Law.

Asóka announced his conversion to the people by flourish of trumpets, and celebrated it by a grand festival, at which fire-works and other festivities found a place. (*b.*)

The intimate connection of *Asóka* with Buddhism may make it desirable for the English reader to have the principal facts of Buddha's life and history here briefly noticed, and the results placed before him of the remarkable scholarship of the present day which have made the Literature of the most distant nations, the Chinese, Singalese, Mongols, Thibetans, Nepalese, and Burmans, render up its treasures in order to complete the picture which the Buddhist and Braminical writings of India afford us.

Sakya Gautama, as he calls himself, a Kshetrya by cast, and of the royal race of the *Sakyas* who ruled at *Kapilavastu* (a town near the modern Lucknow.) *(c.)* was born in the year 598, B. C. He was educated right royally both in the arts and sciences of the day; and he spent the first 28 years of his life in the usual enjoyments of a court, and in company of his three wives, at one of his father's palaces. In his twenty-ninth year reflections on the great problems of life drove him into solitude bent on discovering a remedy for the evils which he observed to prevail in the world. Flying from the royal palace by

(*a.*) Girnar Inscr. IV, 10. (*b.*) Girnar Inscription IV, 3.
(*c*) See 5. Ritter's Asien 510.

stealth, he cut off his hair, and donned the yellow robe, which subsequently became the canonical attire of the Buddhist priesthood, and he betook himself to the fastnesses of the Rajmahal Hills. He next sought out a celebrated abode of Bramins, on a hill near *Gaya*, but soon ascertained that their practises were naught, and their doctrines bootless. He then withdrew to a solitary spot on the *Nílgán* river an affluent of the *Phalgu* where with a few disciples he spent six years in fastings and mortifications of the flesh. But finding that his mental powers became impaired by such lengthened vigils, he renounced these ascetic practices, upon which his disciples deserted him and fled to Benares to expiate the sin of their master. Thus left alone *Sakya Gautama* sat down absorbed in thought, under a *Bodhi* tree (*ficus religiosa*) and invigorated by his more generous diet he succeeded in attaining the highest state of perfect knowledge, and became a BUDDHA or Enlightened.

For the next nineteen years he wandered about northern Hindustan living entirely on alms, and making innumerable converts. His chief resting places during this period are fondly enumerated in later days by his disciples and have formed objects of pilgrimage to Buddhists from the most distant countries even down to the present times. (*a.*)

His royal birth secured for his doctrines a ready acceptance amongst the upper classes of society, and the Rajahs of *Kosála*, *Sravastí*, and *Ayodhia*, or Oudh as well as his own father, vied with each other in erecting spacious *Viháras*, or monasteries, to receive the devotees of the new faith. After promulgating during this period the doctrines which up to the present day have combined the greatest number of mankind, next to the Christian religion, in the same belief, this royal reformer and truly great man, feeling his end approaching, withdrew in company of a few of his disciples to a solitary tope of Saul trees near *Kusinazara* on the *Gandak*, and there breathed his

(*a.*) The pilgrimage of the Burmese Ambassador to Gaya will be remembered by many now in India.

last in the month of Vaisak (April-May) 543, B. C., being the twentieth year of his mission, and the fifty-fifth of his life. *(a.)*
It was therefore 283 years after the death of Buddha, or 260 B. C., that *Asóka* adopted the important step of embracing Buddhism. Having done so, he set no bounds to his zeal in endeavouring to propagate his new religion, and the laws and virtues enjoined by it, not only throughout his own territories, but in all adjoining countries. Many of his proclamations have this object in view. In one inscription he enjoins that a meeting should be held every fifth year, both in the countries conquered by him, and in those in alliance with him (*b.*) There, confession was to be made by each individual, and the leading men were carefully to expound the laws, such as obedience to father and mother, liberality to friends, relations, Bramins and Sramans, abstinence from killing any living being, from prodigality, and from evi speaking.

One of the most important events of *Asóka's* reign was the third Synod of Buddhists which he assembled in the 17th year of his reign B. C. 246. (*c.*) It was then determined to propagate the faith by Missions to foreign parts; and the heresies which intriguing Bramins, insinuating themselves into the *Vihâras,* under the guise of Buddhists, had been studious to introduce amongst the faithful, were then extirpated. Amongst the *Sthaviras* or Leaders (the Thero of the Mahawanso) then sent abroad *Mahadharmaraxita* is mentioned as having been dispatched to *Mahárâshtra,* and Lassen observes that this is the first occasion on which the latter name appears in

(a.) Lassen in another part of his work mentions the following authorities for his life, Collections from Thibetan works, by Csoma de *Koroes,* A. S. *Res. xx. p.* 285; *Schmidt's* History of the East Mongols; a life of Buddha translated from the Mongol by Klaproth, Asia Polygl; Turnour's translation from the *Pali* commentary on the *Buddhavansa,* Jour. of the As. S. of Bengal, vii. p. 798; Burnouf's extracts from the sacred writings in his Introduction a l'histoire du Buddhisme, and Csoma's Analysis of the Thibetan *Dulva,* As. Res. XX. p. 41. p. 393. ff.

(b.) Girnar Inscription, III. 1.

(c.) The first Synod was held by Kâsyapa, whom Buddha had nominated as his successor, immediately after the latter's death B. C. 543, and at this Synod the sacred books of the Buddhists were collected. The second Synod was held B. C. 433, and 12,00,000 *Bhixu* or devotees are said to have been present.

Indian History, and that it probably at this period only comprehended the narrow ancient seat of the Mahrattas in Baglana to the north of the Godavery. The Missionary however in this small district made 1,70,000 converts and 10,000 priests devoted themselves to a spiritual calling.

Asóka was also most successful in his Missionary efforts in the adjoining kingdoms on both sides of the Himalayah, and seems especially to have suceeded in extirpating the previous snake worship which had existed in Cashmire and Gandhára. This latter fact appears in the native history of Cashmire as well as in his own inscriptions. But it was not to India alone that he confined himself. For *Aparántaka*, (some place on the western frontier,) *Suwarnabhûmi*, (either Burmah as Turnour supposes, or the Arabian or Persian coast according to Lassen,) and above all Lanka or Ceylon received the *Wheel of the Law (a)* with alacrity.

To this latter island *Asóka* despatched his own son *Mahindra*, a youth of twenty, who had devoted himself to the priestly calling and a missionary life with an enthusiasm equal to his father's. These efforts were crowned with success, and the Ceylon authorities are full of most minute details of the mode in which the king *Devânám-priya* and the inhabitants of Ceylon were converted to the new faith; the royal family having previously been Braminical in their worship as belonging to the great Arian race of conquerors, and the majority of Singalese being probably snake worshippers. (*b.*)

(*a.*) Bombay Travellers who have visited Ellora aud Ajanta will recollect the frequency of this Buddhist symbol.

(*b.*) These accounts are interesting in another point of view as showing the intercourse between Ceylon and the kingdoms in the interior of India at that early period. But Lassen does not appear to have been struck with the speed at which the journies were made. Thus, the ambassador from Ceylon embarks at Jambukola near Jaffna, and in seven days makes the north coast of India in the Bay of Bengal which, although it would be respectable work for a modern clipper, is perhaps not too mnch for a native craft, such as we now see them in the fishing boats of Bombay harbour, during the S. W. monsoon, but then he reaches Pataliputra from the Bengal Coast in seven days more, which not even the Governor General with all the appliances of the empire could now accomplish. So also, when *Asóka* sent down to Ceylon a branch of Buddha's sacred Pipal tree, which

It is clear also that *Asóka* exerted himself to introduce Buddhism amongst the different Greek monarchies into which Alexander's conquests had been broken up. Thus in the Girnar Inscription we find him asserting that "The king of the *Javana* and further the through him (becoming) four kings, *Turámaya, Antigona* and *Magá* universally follow the prescripts of the Law of the god-beloved Rajah." (*a.*)

The name of Antiochus has disappeared from the Girnar inscription but is found in the corresponding one at *Kapur-ki-giri,* as well as those of Antigonus and Magas.

This mention of contemporary Greek monarchs is most important for Indian history. Magas king of Cyrene died 258 B. C.; Antiochus II of Syria 247; Ptolemy II of Egypt 246; Antigonus Gonatas of Macedonia, 239; and it is not improbable that *Asóka* sent ambassadors to all these monarchs on ascending the throne in 263 B. C. We learn from the Greek authorities the desire which the Seleucidæ and the Ptolemies displayed, to open up diplomatic relations with the powerful Hindu kingdom on the Ganges, and although we may ascribe to oriental vanity *Asóka's* statement as to the adoption of *the Law* in the kingdoms of the West, we may well imagine that the enlightened and tolerant Greek Monarchs in their desire to attract eastern commerce to their new empires would readily encourage *Asóka's* efforts at proselytism.

A remarkable institution was created by *Asóka* in the 17th year of his reign, and which deserves the more notice, as the want of a similar office has often attracted the attention of Statesmen in England. Officers called *Dharma-Mahámâtra* or Ministers of Justice, were appointed to superintend the promulgation and observance of the law in all parts, both, of the kingdom, and of allied states. They were directed to be in attendance at all public places, at Markets, and

miraculously found itself in a golden basket of the Maha-Rajah, the vessel which bore it reached the mouth of the Ganges in seven days from Pataliputra, and in another seven days the vessel containing the holy cutting reached Jaffna on the coast of Ceylon.

(*a.*) Girnar, XIII. The fourth missing name appears in the *Kapur-di-Giri* Inscription to be Alexander, but Mr. Norris (8 As. Journ. p. 303) remarks that the name is not plain.

even in the *Zenanas* of his own family. (*a.*) *Mahâmâtra* also appear to have accompanied his sons, and other great officers as advisers, when placed in charge of a province. (*b.*)

Lassen remarks with justice on the extraordinary value which *Asóka's* inscriptions possess from the numerous minute circumstances which they detail, and which enable us to obtain a tolerably accurate view of the condition of Indian Society at that period, and which at the same time display, in the most favorable light, the beneficial operation of Buddhism on the actions of the Monarch. It is desirable therefore, to notice in some detail the remaining inscriptions which have not been hitherto mentioned, and I will do so nearly in the words of the distinguished German Scholar.

The influence of Buddhism displays itself in the most pleasing form in the anxiety of the Rajah to devote his whole time to the furtherance of his people's welfare both in this world and the next. He reproaches himself for having previously neglected public business, and for not obtaining information of what was going on. With a view to this latter object, he appointed special officers called *Prativedâka* or Informers, who were at all times to bring him intelligence, whether he was in his private cabinet, or amusing himself with his wife and children, or promenading in his garden, so that he might at once dispatch the affairs of State. Orders emitted either by himself, or by his *Mahâmâtra* he first of all laid before a Council of State, and obtained their opinion upon them. He states, that he was not at all satisfied with his own exertions for dispatching business, that he was always at work to promote the good of mankind, and he exhorts his sons and grandsons to observe the same course. But this noble minded man ought to be allowed to speak in his own simple words.

(*a.*) Girnar Inscription VI. 6. Dhauli. V. 4

(*b.*) Hereditary Bramin Officers called *Dharm-adhikari* are still to be found throughout the Deccan, in Kandesh, and even in some parts of the Concan, but I learn from Dadoba Pandurang. Superintendent of Government Schools, that their jurisdiction merely compriz-es breaches of rules of cast, for which they levy fines or ordain penance, and even proceed to excommunication. It is possible that as all this country was formerly a stronghold of Buddhism we may here see one of Asoka's institutions transformed and adapted to subserve the great system of Bramin supremacy.

"For there is no content to me in the discharge or completion of business, and the noblest thing to accomplish is the good of the whole world. But the ground work of this is the discharge and completion of business; there is no higher duty than the good of the whole world. All my efforts are to remove sin from created beings, to make them happy here below, and to enable them to gain heaven hereafter. For this purpose I have inscribed the present law; may it be long preserved, and may my sons, my grandsons, and my great grandsons in the same manner strive after the good of the whole world. This is difficult to accomplish without the greatest exertions." Girnar Inscr. VI. 8, after Westergaard's transcript.

The *Rajaka* were another species of Officers, and their duties are made known to us by the Pillar-inscriptions. They are characteristic of one of the most remarkable institutions of Buddhism. These officers were especially appointed to promote the good of the people, to obtain information of their condition whether prosperous or unprosperous, to enjoin observance of the law, and to prevent its infraction quietly and firmly by gentle persuasion; it would seem that they were not allowed to employ severe punishments. They were directed to station themselves near topes of *Pípal* trees, so highly reverenced by Buddhists, and as these trees are found usually in the neighbourhood of villages, and by their grateful shade afford an excellent baiting place for travellers, the *Rajaka* could not select a better locality for mixing with the people, and ascertaining their condition. Their duties were not confined to this object however, for in another passage they are directed to expound the ordinances of the law to the faithful people. *(a)*.

The inscriptions themselves must also be looked upon as a instrument for promulgating the Law, and for enforcing the virtues enjoined by it, as well as for preventing forbidden actions, and the sins arising out of them, for the Rajah not only recounts his actions, but expressly assigns this end for his engraved monuments. It is not only future happiness, but present, that *Asóka* exerts himself to procure for

(*a*) Dhauli Inscription. V. 1.

his people, and he displays himself to us in these inscriptions as one of the justest and most benevolent rulers of mankind that the world has ever seen. He regards all good men as his children. (*a.*) He does not limit his cares to men alone, but, in accordance with the fundamental law of Buddhism, the *Ahinsa*, extends them also to animals. To numerous birds and beasts, terrestrial and aquatic, he showed special favor, and absolutely forbade the killing of certain specified classes. For the comfort of the outer man, he planted mango topes and *pípal* trees on the highway, and at the distance of every half *Krosa (Kos)* he dug wells, and erected rest-houses for the night. In many places inns (or Durramsalas) were established for the use of man and beast.

The chief end of all his exertions however was the increase of *Dharma* in the comprehensive sense of the word which Buddhists ascribe to it, for with them it signifies not only the religious law, but also the law of nature and duties of every kind. This increase was to be effected by the observance of the two great branches of duty, submission to the law and freedom from sins. To the first branch belong charity, liberality, obedience to elders and teachers, respect to Bramins and Sramans, kind treatment of servants, and other similar virtues. Under the second branch the chief duties are the non-destruction of any fabricated thing, and non-killing of any living being : under this must be included, anger, cruelty, cowardice, envy and similar bad passions.

Three of *Asóka's* virtues deserve to be specially noticed ; His justice in combination with the allied virtue of mildness ; his generosity ; and his tolerance to the faith of other men.

The first is shown in his conquest of Kalinga, when the prisoners were neither massacred nor carried off as slaves. And he describes the glory most coveted by him to be, the discharge of judicial duties with justice, and the tempering of punishment with mercy.

At an early period of his reign, he abrogated several capital punishments, and appears in the latter period of his life, if he did

(*a*) "Every good man is my offspring." Dhauli Inscription. XVI. 5.

not quite abolish the punishment, at all events to have very seldom permitted it. Prisoners condemned to death who had been reprieved, were obliged to make pious gifts and to fast frequently during the remainder of their lives, in order to obtain happiness in the next world. *(a.)*

Asóka's generosity to the Buddhist priesthood has been signalized in a legend which displays the true Indian characteristic of exaggeration; it makes him give away to the assembly of the Arya (the Elect) all his treasure, his empire, his wives and children, and himself, so that at the end he possessed nothing but half of a fruit called *Amálaka.* That he did in fact give his whole kingdom to the priesthood is stated by an inscription which was seen by the Chinese traveller Föe at a comparatively recent period on a column in *Pátaliputra,* and which mentioned that he had given the whole of *Jambûdwipa* three times over to the Priesthood of the four quarters of the world, and had bought it back again with gold. This however may be looked upon as merely a symbolical act, to denote his subordination to the priests, and his obligation to maintain them. The other account of his generosity towards them may be relied upon as nearer the truth, when the great extent of his empire and of his wealth is considered. His own words afford testimony of his gifts to the *Sthavira,* and of his injunctions to the *Mahâmâtra* to distribute presents among them. This liberality however had chiefly in view the furtherance and establishment of the Law; a certain class of *Mahâmâtra* with the title Benevolent, were charged to supply the Ranies and their sons with presents in order that they might dispose of them in charity and obedience to the law.

In respect of *Asóka's* tolerance, although indeed he considered that, for every relation of life, the precepts of *Dharma* were those alone which conduced to happiness and led to eternal salvation, still he recognizes the right of all mankind to live according to their own usages and manners; he is far removed from the desire of enforcing the adoption of the law by persecution, and on the contrary he seeks

(*a.*) Dhauli Inscription. II. 18.

to propitiate his subjects for its reception, by his counsels, his munificence, and his care for the public welfare. It is observable that except in one passage he always ranks Bramins before *Sramans*, *(a.)* and he holds forth the making of presents to them as a meritorious act. This tolerant spirit shines out most clearly in his treatment of the *Páshanda*. *(b.)* He says that, formerly he had honored all these according to their respective manners of displaying reverence. In another passage in his 12th year, he expresses the desire that all *Páshanda* should henceforth live in quiet, if they strove to govern their passions, and to purify their being; but he mentions no measures which he had adopted for converting them to the law. In a third passage he describes his treatment both of Bramins and *Páshanda* more clearly; he concilates the latter and Braminical penitents and fathers of families by gifts and honorary distinctions, not however with the view of increasing the number of the *Páshanda*. He recognizes that they all possess books holy in their own eyes, and all sufficing Revelations. *(c.)* He says, there are different modes of treating them, some are well disposed, others hostile. The former he invites to listen to and obey the law, and so to use the gifts and titles of honor he bestows on them as to make their increase in power conduce to his own. To obtain this end he had appointed *Dharma Mahâmâtra*, both in the capital, and in the land of the *Vrâtya*, as well as in other provinces, and he points out as the results of this measure the great increase of the well disposed *Pâshanda* and their growing enlightment by means of the law.

It might be tedious to relate the various marks of respect which *Asóka* exhibited to honor the memory of the founder of his faith, and it may be sufficient to state that the Buddhist accounts ascribe to him the mystical number of 84,000 *viháras*, *stûpas*, and *Chaityas*. *(d.)*

(*a.*) This term originally means Ascetics, the Σαρμᾶναι of Megasthenes, but was used subsequently to distinguish Buddhist from Braminical priests.

(*b.*) This word is used by Bramins to denote the followers of another faith, and principally Buddhists and Jains; *Asóka* uses it to denote unbelievers.

(*c.*) Girnar XII.

(*d*) The *Vihâra* is the collections of cells usually excavated, in which Buddhist priests lived, and of which the neighbouring island of Salsett contains such an excellent example.

But *Asóka's* architectural magnificence was not displayed in religious edifices only. In the neighbourhood of Girnar he built a grand bridge, and caused his Lieutenant *Tushaspa* to erect other splendid works in the province. Lassen concludes from the Iranic name of this officer that *Asóka* placed foreigners of merit in high posts. He enlarged also, and beautified, the city of *Srinagur* in Cashmire, and built there two large palaces.

I have been studious to select from my authorities all the passages relating to civil government which redound to the credit of *Asóka*, for on his successful efforts in this department must his chief claims to greatness in the nineteenth century depend. But it should not be omitted to state that he appears to have obtained no inconsiderable share of what may be called the more vulgar glory of kings. He added to the immense empire created by Chandragupta, the Kingdoms of *Petenika* or the west coast, Kalinga on the east, and Cashmire in the north, all of which he acquired by conquest, although the native chronicles of the latter province ascribe its acquisition to inheritance, *(a.)* but, as is clear, erroneously. His neighbours on the western frontier were the *Gándhára*, *Gamboga*, and *Javana*, the two former being probably the names of nations in East Kabulistan, and the latter, not precisely Greeks, but the mixed population including a great number of the latter race who then inhabited West Kabulistan. To the eastward his kingdom probably included the whole of Bengal, but did not reach further in the Deccan than the southern limit of the province of *Kóla*. *(b.)*

Asóka died 226, B. C., in the 37th year of his reign, having married three years before his death an attendant on his first wife *Asandhimitrâ*, who, having embraced Buddhism with enthusiasm, died in the 30th year of the reign. *(c.)* The waiting maid does not appear to have been much better than she should be, and the passion she is said to

The *stûpa* according to Burnouf is the *tope* of northern India, implying an erection of masonry, in one word a *tumulus*; the *Chaitya* on the other hand is a tope consecrated to religious purposes; and it usually marks either the deposit of relics, or some action in the life of Buddha.

(*a*) Raja-Tarangiri, I. p. 101. (*b*) The modern Carnatic.

(*c*) Mahawanso, p. 122.

have displayed for the son of her husband, the beautiful eyed *Kunála*, will remind the classical reader of Phœdra.

The subsequent history of *Asóka's* dynasty reads a sad moral to mankind as to the instability of human institutions, and displays the inherent evil existing in despotism from its inability to secure even for one generation the maintenance of ordinances almost divine in character.

The empire of *Asóka* appears to have been broken up into small principalities immediately after his death. *Kunála*, the beautiful eyed carved out for himself a Raj in the Punjab; another son, *Jaloka*, acquired Cashmire, where he introduced the worship of Siva, and persecuted Buddhism. A third son appears to have retained a portion of his father's inheritance on the Ganges, and in a few years, or 178 B. C. the last traces of the dominion of the Mauryas disappear. (*a.*)

It would scarcely be proper to conclude this notice of *Asóka's* history, according to the facts deduced by Lassen from the monuments and from Pali literature, without some mention of the doubts which, the readers of this Journal are aware from Dr. Wilson's late article on the Caves, (*b.*) have been thrown upon the inscriptions by our great English orientalist Professor Horace Wilson. It is curious enough however, that at the very moment when the latter writer was pronouncing that scepticism should be maintained respecting them, until they had been interpreted by some person who was at once a thorough Sanscrit and Pali scholar, (*c.*) the scholar who has devoted more time to the critical study of these two languages than any body, probably, in the

(*a.*) To enable the reader to examine some of the originals of *Asóka's* history more closely, I subjoin the following references.

Girnar Inscription; Prinsep, VII. Bengal Journ. p. 219, but a far better transcript by Capt. LeGrand Jacob and Mr. Westergaard, I. Bombay J. p. 257, and revised text by H. H. Wilson, XII. As. Journ. 153.

Dhauli Inscription Prinsep, VI. Bengal Journ. p. 566; VII. Bengal Journ. 434.

Kapur-di-giri Do., Masson's Narrative, As. Journ. VIII. p. 293, and article by Norris, ib. p. 303. revised text, XII. As. Journ. 158, by Prof. H. Wilson.

Firuz Shah's Láth, or the Delhi Pillar, Prinsep, VI. Bengal Journ. p. 566.

Allahabad Pillar; Lt. Burt, III. Beng. Jour. p. 105; Hodgson, ib. p. 481; Prinsep, IV. Beng. Journ. p. 124.

(*b.*) III. Bombay Journ. p. 36. (*c.*) J. of R. A. S. XII p. 251.

world, should be then occupied with the very investigation in question. It is therefore, probably, not necessary to notice in detail the provisional doubts which Professor H. H. Wilson, (*a.*) has thrown out as to the identity of *Asóka* with the Rajah *Piyadasi* of the inscriptions, and as to the connection of the Edicts with Buddhism. It would indeed be highly presumptuous for any but a profound oriental scholar to venture to offer an opinion, if two such distinguished orientalists as Lassen and Horace Wilson were in controversy; but the fact is not so, and the case is that each has been expressing independent opinions at the same time, the latter on a portion only of the subject, whilst making a most valuable collation of the *Kapur-di-Giri* text with the inscriptions of Girnar and Dhauli, the former on a critical, laborious, and evidently most conscientious, survey of all the records applicable to the subject. As each of these scholars has addressed the literary world at large, by printing the Pali text in Roman characters, every one interested in these inquiries will naturally form some conclusion or other on the premises, and I am bound to confess that when comparing the dry, lifeless, and sometimes unmeaning, version of the inscriptions by our distinguished countryman, with the results deduced by Lassen, the conviction that, in the main, true history is before me in the latter's version, becomes irresistible, and the assumptions of Professor Wilson to account for undoubted facts, with the suggestion of a myth, after the manner of Strauss, do not appear to me even plausible.

The main arguments against the identity of *Asóka* with the author of the inscriptions are founded on the absence of his own name, and on a suggested anachronism in the mention of a Greek Monarch, who flourished later than the known epoch of this Hindu king. The Rajah in these inscriptions call himself *Devánám-piya* (God-beloved, or Theophilus), and *Piyadasi* or *Piyasi* (benevolent, or kindlooking), and it is admitted that these are not proper names but mere epithets. Whatever Monarch it was therefore, who styled himself by these epithets, he dropped the use of his own name, and therefore, the argu-

(*a.*) Professor H. H. Wilson, read his paper on the Rock Inscriptions before the Asiatic Society, 3d. Feb. 1849; the second volume of Lassen's *Indische Alterthumskunde* was not published till 1849, and was probably at that moment in the press.

ment 'it seems very inexplicable why, in none of the inscriptions his own appellation, *Asóka* or *Dharmasóka*, should ever be mentioned' is not more applicable to *Asóka* than to any other Rajah, and the argument is only valid to show that no Rajah with a proper name would drop it for an epithet; on which reasoning one might be driven to doubt the existence of Cœur du Lion, or le Cid. But it is not at all difficult to understand why, on such an important occasion as the adoption of Buddhism, *Asóka* should also adopt two celebrated Buddhist appellations, as we find, by the authorities cited by Professor Wilson himself, *Piyadasi* and *Devánám-piya* to be. That it was not an anomalous practice for a Hindu Monarch of that period to change his name on a great occasion, we learn from the Mahawanso, c. XXI, which expressly states that a contemporary of *Asóka's* did so, on mounting the throne in Ceylon. Indeed as the Singalese Monarch *Tisso*, whom *Asóka's* son converted to Buddhism, is also distinguished by the same Buddhist epithet *Devánám-piya*, it is probable that the whole of his name *Devánám-piya Tisso*, was also adopted on that occasion, the epithet from its popular Buddhist character, *Tisso*, or *Tishya*, from its being the name of *Asóka's* chief Sthavira or Thero, the son of *Moggali*, who influenced *Asóka* to send out missions to Foreign Parts. (*a.*) *Asóka* might also have other reasons for assuming a new name, as we learn that the Bramins had stigmatized a namesake of his on the throne of Mágadha by a nickname *Kálasóka*, or *Asóka* the Black, an epithet which has never been considered complimentary amongst Hindus.

(*a.*) Is it possible that this similarity of name between the two Buddhist Monarchs, can have led our learned member Dr. Wilson to suggest that the passage he cites from the Mahawanso, in vol. III, p. 81, of our Journal, points at the Ceylon Monarch *Devánám-piya-tisso*, as the author of *Asóka's* inscriptions. The passage says, as clearly as words can express, that the son of Moggali sent out missions to foreign parts, and Lanka or Ceylon is enumerated amongst these foreign parts. The language therefore is clearly inapplicable to a king of Ceylon. But further it also clearly appears in another part of the Mahawanso who *Moggaliputto* was, viz., Tisso the head of Asóka's great *Vihara* at *Pataliputra*, and who, the southern Buddhists pretend, was the earliest follower of Buddha. See authorities collected in the 2 Lassen's Alterthumskunde, p. 73. I may also observe that Professor Horace Wilson has omitted to notice that the third convocation, mentioned in the passage cited from the Mahawanso, has received complete verification as true history

But why is it necessary to resort to speculations on the probability or reasons for *Asóka* assuming a new name, when we find him undoubtedly identified with the epithet in the Dipawanso (*a.*) which is not disputed to be the oldest Pali historical work remaining, and which was of such repute in Ceylon in the fifth century after Christ, that it was ordered to be read publicly. (*b.*) Lassen also states that *Asóka's* successor *Dasaratha* was called by the same epithet *Piyadasi (c.)*

Professor Horace Wilson, however, departing from the course of careful philosophical scepticism which he had previously adopted, gets warmed, by investigation of the subject, into positive assertion, and on discovery of a supposed anachronism he lays it down "that Piyadasi was the contemporary of Antiochus (the Great) or even posterior to him, is evident from the inscription, (Girnar XIII.) and *therefore Piyadasi and Asóka are not one and the same person.*"

But this bold conclusion depends entirely on the assumption of the Professor that the Antiochus mentioned in the inscriptions is Antiochus the Great, and not his predecessor Antiochus Theos, who was *Asóka's* contemporary. It certainly seems difficult to understand on *a priori* reasoning how any relations should exist between the latter Monarch and *Asóka,* but any difficulty on this score is exceedingly enhanced, when the case of a petty ruler on the Mediterranean seabord is considered, for undoubtedly no two Monarchs of antiquity can be pitched upon more remote in interest as well as in geography than the sovereigns of Cyrene in Africa and Palibrothra on the Ganges. Yet all scholars agree that the *Magá* or *Máko* of the inscriptions means Magas king of Cyrene. This conclusion seems to teach us that we ought not to attempt too curiously to reason on the existence or non-existence of facts from inherent probabilities, if the facts themselves are clearly made out to us. So difficult is it to account for the causes and motives that lead to human action, that, even in the com-

by Capt. Burt's discovery of the engraved tablet of *Asóka* near Bhabra, in which a record is preserved of the Synod in question. See J. of As. S. of Bl. IX. p. 616.

(*a.*) See J. of As. S. of Bl. VII. p. 791.

(*b.*) 2 Lassen, Indische Alth. 16.

(*c.*) Ib. 223 n.

monest occurrences of life, and where the most stringent interests exist for eliciting 'the truth, the whole truth and nothing but the truth', indisputable facts occur which baffle all the powers of human reasoning to account for. The disposition to deny facts which clash with a preconceived theory, lies deep in the human breast, and has been happily ridiculed by Moliere in L'Amour Medicin, where the waiting maid's empiricism is too much for all the arguments from Hippocrates, 'Je ne sais pas si cela se peut, mais je sais bien que cela est.'

If, of the four Greek sovereigns named in the inscriptions, three of the same name are proved clearly to be contemporaries of *Asóka*, the obvious conclusion is that those are the parties intended, although there is little or no trace of the causes which brought them into connection. The fourth name *Alikasunari* or Alexander is enveloped in obscurity; it appears only in the *Kapur-di-giri* inscription, and an exact transcript and critical study of the text are admitted, both by Horace Wilson and Lassen, to be still wanting.

The general scholar therefore may probably rest satisfied, that *Asóka's* story is placed on a sound historical basis, though as to certain details there is room no doubt for much scholarly discussion, and much additional information may still be brought to light. (*a.*)

(*a.*) Dr. Stevenson of our Society, and there is no one in India more competent to form a sound opinion upon the subject, informs me that to give to the world satisfactory transcripts of the *volumes* of inscriptions which the Buddhist caves of *Nasik, Junir, Keneri, and Carli* present, and which would undoubtedly throw light upon many points now enveloped in darkness, would occupy ten years of the time of a competent scholar. As the Government of Madras with great liberality, has devoted for years past the services of a very able officer to the caves of Ajanta, where there are no inscriptions (or very few), but merely frescoes, what a noble opportunity it would be for the Government of Bombay to promote the knowledge of Indian Antiquities, by devoting a yearly expenditure of half the amount to their Western caves. An allowance of £300 a year for a few years, would probably secure the services of one of those enthusiastic scholars of the school of Lassen, whom only a German University Town, or Paris with its noble public libraries, seems capable of producing, and who would make known to us these valuable documents now daily perishing before our eyes.

ART. II.—*Ancient remains at the Village of Jiwarji near Farozabad on the Bhima.*—BY CAPTAIN MEADOWS TAYLOR, Nizam's Service. (Communicated by GEORGE BUIST, Esq. L. L. D.)

The ancient remains at the village of Jiwarji though somewhat different in character from those at Rajan Koloor and Hajinitji, are yet identical in many respects with them, and whether more or less ancient, appear evidently to belong to the same family as the Celtic and Druidical or Scythic remains of England and Brittany, where they abound, as well as in Denmark, Russia and Circassia, and in parts of India, where those of the Nilgherries and the hill country to the southward of them are perhaps the most remarkable and abundant.

My own speculations on the identity of the "Cromlechs," and "Kistvaens," of Rajan Koloor and Hajinitji, with the Druidical remains of Anglesea and the other parts of Great Britain, led me to assume that they belonged to the same religion and people, however widely apart as to situation; and my speculations dim and undefined as they were, have been lately confirmed in a great measure by the perusal of a very interesting paper on the subject, of the monumental remains of the Nilgherries by Captain H. Congreve, Madras Army, which was published in No. XXXII January to June 1847, of the Madras Journal of Literature and Science, and which as far as my opinion goes, entirely justifies the assumption that the remains on the Nilgherries were those of Indo-Scythian tribes whose faith was Druidical, and who, nomadic in their habits, entered India at an early period, eventually settled there, and have their representatives in the modern Todawars or Thautawars of the Nilgherries, a race which still preserves the dress and food, mode of sacrifice and sepulture, and many of the customs of their progenitors and have avoided idolatry.

To attempt any analysis of Captain Congreve's valuable and interesting paper, would be impossible here, nor is it needed further than as authority in reference to what has come under my own observation; but all things considered, whether in relation to the size

and perfect condition of the remains at Jiwarji, their great number, and absolute identity of form and contents with others referred to, I am induced to suppose that there are no more remarkable collections in India, if perhaps in the world; except those at Yemmi Good near Kanagerry which were described to me by a native as greater in extent, larger, and more ornamented than the Cromlechs of Rajan Koloor. I now regret that I had not the whole of the Cromlechs and Kistvaens at Rajan Koloor and Hajinitji counted, but I may be able to make another visit to the place this year, when this essential particular will not be omitted. It is evident that the remains at Yemmi Good would be well worth a visit.

The Scythic Druidical remains whether of England or Brittany &c. have three general characteristics, viz. Cromlechs, Kistvaens, and Cairns, Barrows &c. the latter of various forms.

1st. Cromlechs, or stone Moles, are constructed with three flat stones or slates placed edgeways in the ground enclosing three sides of a square or paralellogram, as supports or walls, with one at the top as a cover usually larger than the others; and having one side open, usually the north or north-west. There is usually also a flooring of slabs. These Cromlechs are not as numerous at Rajan Koloor and Hajinitji as the Kistvaens or closed Cromlechs, but there are still many, and all exactly correspond with the Cromlech called Kitts Coty House near Aylesford in Kent, (a small one), with those at Plas Newydd in Anglesea, and those in Brittany and the Nilgherries. The most remarkable of the remains as to size, in England, is one of those at Plas Newydd, the dimensions of which are given as follows: viz. upper slab 12 feet 7 inches long by 12 ft. broad and 4 feet thick, supported by five stones forming the sides of the enclosure.

On reference to the drawing and measurements of one at Rajan Koloor I observe that they are as follows: viz. upper slab or cover 12 feet 3 inches long by 10 ft. 6 in. broad; side slabs 12 ft. long by 7 ft. high, including two feet in the ground; there were others differing very little indeed in measurement, and all forming noble groups. The style of erection is precisely the same in every respect with the European and Nilgherry ones, and the dimensions of the interiors also closely cor-

Fig. 1.

Fig. 2.

Cromlech at Achenny Nilgh.[r] Kitt's Coty House Kent.

Fig. 3.
Front View.

Fig. 4.
Side View.

a.a. Circle stones. b. Side- Fig. 6. entrance slabs c. Kistvaen.

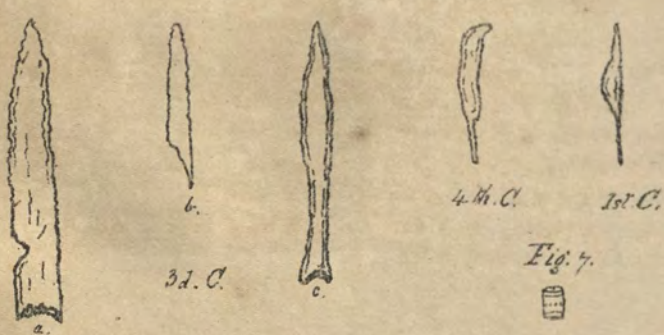


Fig. 7.

M. T. delt.

H. I. C.

respond with them. Annexed are tracings (Plate, II. figs. 1, 2), from the drawings of Cromlechs given by Captain Congreve. I did not find funeral remains such as urns or other earthen vessels in any Cromlech opened, and this tallies with results elsewhere observed. The Cromlechs therefore have been Altars, as supposed in England, or covered Temples in which funeral ceremonies were performed. Several of the Cromlechs at Rajan Kolooor, are surrounded by a circle of stones. This corresponds with the Cromlechs at Trer Dryn in Anglesea, and other places referred to by Captain Congreve, as also on the Nilgherries.

2d. Kistvaens or closed Cromlechs.—These are described as existing in England and Wales, "frequently occurring in those places most favored by the Druids." They form the majority of the monuments at Rajan Koloor and Hajinitji, and appear of precisely the same construction as those in England, and on the Nilgherry hills. Captain Congreve mentions them as occurring on the Mailgherry hills, 30 miles south of Ooxoor, at Naikenary on the top of the pass of that name, also in Malabar, Ungadapoor and Mungary, in south Coimbatoor, in Travancore, and one at Pulliconda near Vellore.

Captain Kittoe, quoted by Captain Congreve, finds them in the forests of Orissa,—"at this place Goorsunk, I remarked a number of stones placed in the same manner as the Druidical monuments, such as Kitts Coty House near Boxley in Kent; viz. three [stones] set upright with one on the top of them. These houses are very small &c."

Those at the Nilgherries and those I have found, are the same in one very remarkable particular, viz. the circular aperture in one stone or monolithe, as if left, as Captain Congreve suggests, for the introduction of urns from time to time. Their size differs greatly from the smallest square of 18 inches to 2 feet, to the largest of 6 to 7 feet long and 5 feet broad. Only the largest have circular apertures. In the smaller ones, the top slab or cone might be removed and replaced without much inconvenience. Captain Congreve thus describes some near the fort of Adi Raer Cottay on the Nilgherries :—

"In the sequel I ascertained that about a mile beyond Adi Raer

Cottay there were some stone edifices ascribed by the Burghas *to the former Dwarf inhabitants of the Hills.*"

"The Kistvaens were nearly buried in the vegetable soil, a fact considering their height, (five feet), that sufficiently attests the high antiquity that may be assigned to them. When these structures occur in the low country they are found on the summits or sides of rocky hills devoid of jungle, and hence appear in the state they were originally constructed, unencumbered with soil or rubbish. After removing a large slab five feet long, three broad and one thick, which served as the roof of one of the closed Cromlechs, I proceeded to excavate the earth that had fallen inside, and reached the floor, another large flag eight feet long by six broad; here I found fragments of clay vessels, probably remains of funeral urns. The chamber being cleared, presented four walls, each consisting of an entire stone, and was seven feet long by five broad. The monolithe constituting the eastern wall was pierced by a circular aperture about nine inches in diameter, adequate to admit the body of a child who I conjecture was employed to place the urns inside."

The belief is prevalent at Jiwarji, that the "Mora" People, supposed dwarfs of three spans high, constructed the remains at Rajan Koloor, Yemmee Good, Hajinitji, &c. These remains are also attributed to fairies and dwarfs by the superstitious of Wales, Dorsetshire, Cornwal, Brittany, &c.

The monuments at Rajan Koloor and Hajinitji are on bare open spots, and gentle rises from rivulets. The ground is hard rock or strong morum a foot to eight inches from the surface, and the Cairns and Barrows at Jiwarji, are also on a hard gravelly elevation which has only a thin surface soil.

The whole of Captain Congreve's description exactly tallies with what I saw at Rajan Koloor and Hajinitji, and the circular aperture in the monolithe or slab of the side, marks the identity very strikingly. Captain Congreve states the aperture to have been in the east side or wall, but in those I examined, it was uniformly, I think, in the south side or southwest. No other remains appear to have been found in the Kistvaens either of England or the Nilgherries, but urns

with ashes and bones, mixed with charcoal, which tallies precisely with my own experience.

Images were found in some of the Cairns &c. in the Nilgherries. I have found none at Jiwarji yet, nor have any that I am aware been found in Brittany or England. This would appear to class those in England, these at Jiwarji, and those in the Nilgherries in which no images were found, (the Kistvaens for instance) as the earliest, and those in the Nilgherries in which images were found, as belonging to a later class; probably corrupted by Buddhism or Jainism, which was powerfully established in the hills and in the plains below them, throughout Mysore. Druidism was not idolatry, but degenerated into it, perhaps through the Scandinavians or other Celto-Scythic tribes, and so passed into England. There is a strong affinity between Woden and Buddh or Bodh, and by many they are supposed to be the same. Could then idolatry have begun in India from Buddhism, and have spread west-wards through the Druidical religion so corrupted by the Buddhists?

It may be presumed, I think, that the absence of images in Kistvaens and Cromlechs justifies an assumption for them of a higher antiquity and purer Druidical faith than the Cairns, Barrows, &c. in which images are found.

We see therefore that the circular aperture in one monolithe is common to the Kistvaens of Europe, of the Nilgherries (Congreve), of Circassia (Bell), and of Rajan Koloor &c. The size, construction, situation in groups, contents as to ashes mixed with charcoal, &c. &c. all agree in the minutest particulars. Subjoined are tracings (figs., 3, 4,) from the drawings of a Kistvaen given by Captain Congreve. There were scores of the size given by Captain Congreve, both at Rajan Koloor and Hajinitji, as well as smaller ones, down to the sizes like three legged stools, noted by Captain Kittoe.

3d. Cairns and Barrows.—These are found sparingly with the Kistvaens and Cromlechs in comparison with themselves. They consist of circles of large stones, sometimes single, sometimes double, enclosing a space under which is a grave, or graves, a stone-chest, or chests, in which bodies and sometimes funeral urns have been

deposited. I need hardly say that, with the Cromlechs, they are common to England, France, Germany, Central Asia and parts of India; and though minor details of form and of the articles found in them differ in unimportant respects, the general results are everywhere the same, and the form and mode of sepulture identical.

They appear to be divided into two classes, one which contains urns &c., having been filled with human ashes, bones and *charcoal*, and the other in which bodies have been interred *without* urns, filled with ashes or *charcoal*, but accompanied by rude images, arms, earthen, iron and brass utensils and the like. These may be of an era subsequent to the first, and when, though the old custom of sepulture had not been abandoned, the rude but simple faith of older times had been corrupted by idolatry.

Be this as it may, Captain Congreve's patient investigations on the Nilgherries, shew a variety of results in regard to the forms of the Cairns or Barrows, minor points differing even there; also in the nature of the relics found; but none in regard to the general features, mode of sepulture &c. between his results and those of parties in England by whom similar remains have been explored. The same kind of vases or urns containing ashes mixed with charcoal, the urns being of good strong pottery with a peculiar glaze of a rich *red* color, knives, spearheads, &c., are found in Dorsetshire as on the Nilgherries. Brass cups, beads, and often a bell, are common to both the latter, forming the strongest presumptive link that the Thautawars, to whom a bell in the sacred Dairy is an object of worship still, are the remains of these Scythic Druidical tribes in India.

At Rajan Koloor there are many Cairns and Barrows interspersed with the Cromlechs and Kistvaens, some of these have small Kistvaens in the centre, some open at top, others closed, others have no Kistvaens but a stone only to mark the centre; but all, or most, have two slabs of stones set on edge about two feet asunder, forming as it were, an entrance to the grave on the south or southwest side, a peculiarity which I do not find mentioned by Captain Congreve, or alluded to by him as existing in England.

The foregoing will give a general idea of the connection, al-

most identical, between the three general classes of European ScythoDruidical remains, and those of the Nilgherries, Rajan Koloor and Hajinitji, and I have no doubt whatever, that the Cromlechs and Kistvaens &c., of Yemmee Good near Kanagerry would, if examined, contribute their full share to the elucidation of this most interesting subject of investigation.

I proceed now to describe the remans at Jiwarji.—This village, one of the Kusbas of the Andola Talook, is situated, about three miles south of the Bhima river on the high road between Calburgah, Farozabad and Shorapoor. About a mile from it, immediately to the right of the high road to Farozabad, upon a rising ground sloping to the south, there are a great number of Cairns and Barrows, filling the area of a paralellogram of 336 by 216 yards. Having had the whole carefully counted, I found there were, small and large, 375. These Cairns and Barrows are of all sizes, varying from diameters of 40 feet inside the circle of stones to 68 and 10 feet respectively; some of them have single circles, others double. The double ones being usually the largest Cairns, though not always. The number of stones in these circles varies from 24 to 36 in the single circles, and from 48 to 58 in the double ones. Where the circles are double, they are from three to four feet apart, the stones forming them, being placed touching each other or at short intervals. I observed that in some Cairns with double circles, the space between the circles had been neatly paved with small flat slabs of slaty limestone, portions of which remain. Some of the Cairns have small square enclosures in the centre, probably Kistvaens, from which the top may have been removed, these are always composed of four slabs of limestone set upright, which project about a foot, more or less above the surface. The spaces enclosed being from two to three feet square. The circles of the large Barrows or Cairns are composed of large trap boulders which have evidently been brought from the rising ground to the westward about a mile distant, where the trap meets the limestone formation. These black circles of stones therefore make the Cairns very remarkable objects, as the soil they are upon is a very light coloured limestone, and as there is little or no vegetation the stones have not been covered by grass or earth, or very slightly.

I should mention also that some of the Cairns have long stone-chests formed of thin slabs of limestone laid edgeways, upright, and projecting a little above the surface. None of these have tops or lids, and the graves, (as these were,) no doubt have been filled in, (as well as the spaces enclosed by the circles of stones,) with loose stones and earth, the hard ground below not having been dug into. Possibly these were graves of the poorer members of the tribe who could not afford deep excavations.

In all, however large, the space within the circle-stones, has been filled up with loose stones and earth, rising towards the centre. The entrance-stones as I may perhaps call them are from 5 to 6 feet long, and 4 to 5 ft. high, and have been let in to the earth or stones from 3 to 4 feet. Fig. 5, is a profile of one of these Cairns and corresponds exactly with one of the drawings of some Cairns in Captain Congreve's paper. I am thus particular in description as it may be interesting and important to observe the similarity or difference which exists between these and Cairns at other places.

Having selected one of the largest and most perfect for excavation (fig. 6.) I found it of the following dimensions. Diameter of the inside circle 40 feet; outside circle 48 feet; space between the stone-circles, including the stones, 4 to 6 feet. Two upright slabs of limestone about five feet long, and two feet asunder, appeared about 18 inches above the surface of the Cairns, and near them on the southwest side I began the excavation. These slabs lay northeast and southwest, or nearly so, and the same may be remarked of all similar stones and Kistvaens in this Cemetery. A space of ten feet wide was marked off in the direction of the stones across the Cairn, and the surface-excavation was confined to this breadth, as I considered that such a trench would completely expose the contents of the Cairns whatever they might be. The loose stones and earth continued to a depth of four feet eight inches in the centre, in a circle of eight feet diameter, the sides gradually sloping upwards to the surface circle-stones. Below the loose stones, the ground was very hard and firm, scarcely yielding to the pickaxe, being morum which had formed into a concrete mass. But as nothing had appeared among the loose stones, either urns or

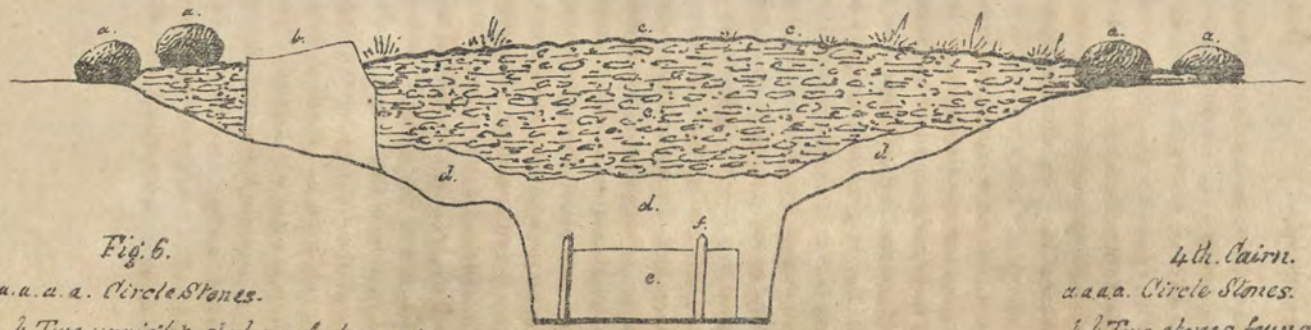
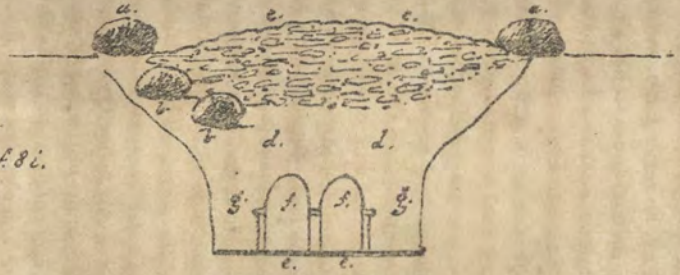


Fig. 6.

Fig. 6.

a.a.a.a. Circle Stones.
b. Two upright slabs 2 feet apart.
c.c.c. Loose stones.
d.d. Earth & Morum.
e. Stone-Chest.
f. Transverse slab.
Floor to loose stones, 6 f. 4 i.
Stones to top of Cairn, 4 f. 8 i.



4th. Cairn.

4th. Cairn.
a.a.a.a. Circle Stones.
b.b. Two stones found misplaced.
c.c. Loose Stones.
d. Earth.
e.e. Stone Coffin.
f.f. Head stones.
g.g. Spaces filled with Earthen Vessels.

N.B. The pottery, spearheads &c. in the other parts of this Plate are one fourth of the size of the articles they represent.

N.T. delt.

F.T.C.

stone-chest, I determined to dig as deeply as possible, supposing that so considerable a Cairn could not be without remains, and I directed the centre to be explored to the depth of at least six feet more.

The strong earth and morum continued for four feet, when a corner slab of limestone appeared, laid transversely, which having been removed, the workmen found a few bits of broken pottery and an earthen saucer that broke on the touch. The earth having been further cleared away, other transverse pieces of stone were found and afterwards the sides of two upright slabs of limestone appeared, across which the transverse pieces had been laid as it were to form a lid; there was no longer doubt therefore that this was the coffin or stone-chest, and the examination was carefully continued. The earth was however so hard and dry, that there appeared little hope of extricating any of the remains of pottery which now appeared, and the cross lid pieces of the stone-chest having broken from the superincumbent weight and fallen in, the earth above and beneath had become one mass.

The sides of the chest clearly appeared after a short time and then some portions of human leg-bones. On advancing further towards the head, the bones of the skeleton were more perfect, but so brittle that they could not be separated from the earth, at last a skull appeared, which, after some contrivance came away whole. The body it belonged to, had been laid face downwards, and the impression of the face of the skull was perfectly distinct in the earth below. Fig. 7. is an outline of the upper part of the skull as far as the eye, taken from actual measurement. I had no drawing instruments with me and when I returned the next morning I found to my regret that though the skull had been carefully put aside in a basket, the whole of the lower-jaw teeth, facial bones and nose had crumbled away. The profile of the face was peculiar; the chin having considerable projection, and the nasal bones being of unusual thickness and breadth. The two front teeth of the upper jaw were remarkably large and projected over the lower. The skull however appeared very small, but from the character of the teeth which were all perfect but one dou-

ble one (which had been carious) and the firmness of the skull and its sutures, it was evidently that of a full grown person. Below this body were two others, or their remains, but not so perfect as the upper one. The skull of one was remarkably thick and the head appeared to have been large. The length of two of the skeletons from the head to where the small bones of the toes were, were severally, the first 5 feet 7 inches, the second 5 feet 5½ inches, the third being undistinguishable. The bodies lay north-east and south-west, the heads being north-east. The only thing found in the chest was a single cornelian bead of an oblong cylindrical shape, (fig. 7). Below the bodies, slabs of limestone had been placed to form a floor.

Immediately at the head of the bodies was a cross slab of limestone, and about two feet of the side slabs appearing to remain, the excavation was continued. Behind this cross piece there seemed to have been placed one large earthen vessel and many small ones, with some earthen incense burners. The large vessel was got out whole, the rest were entirely broken or fell to pieces on being exposed to the air. Continuing the excavation about three feet northward, the natural side of the tomb appeared, shewing that the bounds of the grave had been reached. In this portion of the grave some pieces of iron, evidently spearheads, were found, but much decayed, and a weapon (fig. 8) by them, but no ashes or charcoal, nor did the vessels contain anything but earth; probably it may have been the custom to fill the earthen pots with grain, milk, ghee, &c., and deposit them with the bodies at interment.

The earth appearing loose on each side of the stone-chest it was excavated down to the floor of the tomb. On the west side remains of two thin skeletons appeared of smaller size, possibly those of women, with some earthen incense burners &c., but the earth being soft and damp here they could not be removed. The eastern side was filled up with small earthen cups and vessels, incense burners &c., of these figs. 8, & 9, were got out entire. They are very neatly made, and are either of red glazed pottery of a bright red colour or half red and half black. The glaze is inside as well as outside.

By the side of these vessels, a small iron-tripod and two spear-heads much decayed were found. Some other pieces of iron were so decayed as to be undistinguishable in form.

The second Cairn examined had a double ring of stones measuring 16 feet in diameter, with 4 feet on each side, total 24 feet. The excavation was begun at the upright stones above the ground in the south-west side, and a little below them were two large pieces of trap-rock. The loose stones continued to a depth of three feet, after which morum and earth to a depth of five feet two inches, making in all eight feet. In the centre of the excavation the remains of a human body were found, but no portion of it was entire, portions of leg and thigh-bones of great thickness and strength, and part of a very thick scull were all that was distinguishable. On the west and east sides of the body were the usual small earthen pots &c., and in cosiderable quantity, but the concrete formed by the limestones, earth and morum was so hard that no entire vessel could be got out. With these were the remains of three spear-heads of iron much decayed, but still distinguishable in form (fig. 10.)

There was no stone-chest or coffin in this Cairn and the body had been laid on the bare floor of the grave, which was 7 feet long by 4 broad, including the space taken up by the vessels on the east and west sides. The remnants of pottery were of the same colour and form as those of the first Cairn examined.

The third Cairn was 16 feet in surface diameter and had also a single ring of stones of large size, measuring usually 3 feet long, 2½ broad and 14 to 16 inches thick of irregular forms, (trap boulders). It may be mentioned that the circle-stones of all the cairns are the same size or thereabouts. The excavation was begun and carried down as in the others and continued to a depth of 8 feet 9 inches, of which the loose stones were three feet from the surface, and earth for the remainder. The earth in this Cairn was looser and more easily got out than in the others, and at the floor of the grave fourteen small vessels of various sizes were obtained, some quite entire, others slightly cracked or chipped. No trace of former remains was found by them, but this may be attributable to the com-

parative soft quality of the earth, in which the body had doubtless entirely decayed. Some remnants of iron, and among them part of two heads of spears, and a flat pointed piece which may have been portion of a sword (figs. 11, 12, 13). The earthen vessels were of the same colour, red and black, as those in the other cairns, and all glazed.

The area at the bottom which contained these remains was eight feet long by seven wide. There was no stone-chest, nor upright slabs forming a lining for the sides or to contain the body.

The fourth Cairn had 24 feet of surface-diameter and a double ring of stones, making in all 32 feet. The stones were of limestone breccia which is found near an adjacent rivulet. The same loose stones continued to a depth of four feet, after which there was gravelly earth. At a depth of 6 feet 6 inches from the the top there were some transverse lime-stone slabs, of which a few were whole and others broken and fallen in; clearing away these carefully, the sides of two stone-chests or coffins appeared, that is, the two long slabs north and south, as nearly as possible, forming the outside boundaries of the chests; and one entire piece in the middle 1½ inches thick dividing the space into two; the whole length, was from 6 feet 6 inches to 7 feet; the breadth of each division 1 foot 8 inches. At the feet were upright slabs fitting closely into the breadth of each chest, and similar pieces 2 feet 8 inches high at a distance of 5 or 6 inches from the feet. The whole space enclosed therefore was 5 feet 6 inches long, 1 foot 10 inches high, and 1 foot 8 inches broad, the slabs being neatly put together.

The earth being carefully removed, the remains of one person in each grave were observed. The one to the east was more perfect than any yet seen, and the bones of the thighs and legs, pelvis, arms &c. could be easily traced though they broke on being touched. On removing the earth carefully from the head, it was found nearly whole resting upon its left side with the face to the earth. The teeth were entire in the upper jaw and their enamel still bright; and also enough of the skull to allow of my sketching the profile from actual measurement as it lay (fig. 14). The teeth of the upper-jaw were

1st. Cairn.

4th. C.

4th. C.

1st. C.

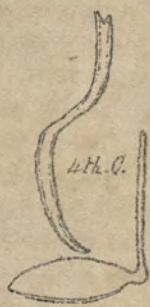
1st. C.

1st. C.

4th. C.

1st. C.

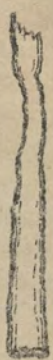
1st. C.



4th. C.

4th. C.

1st. C.



1st. C.

1st. C.

1st. C.

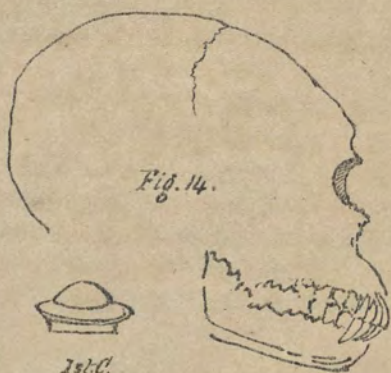
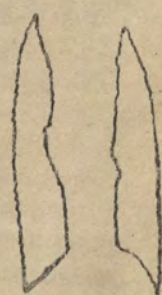


Fig. 14.



4th. C.

M.T. delt.

H.I.C.

large and remarkably thick, and projected somewhat over the lower ones. It was impossible to remove the skull entire as it had become decayed and adhered firmly to the stone-floor of the grave.

The entire length of this skeleton was five feet two inches from the crown of the skull to the feet, which had rested against the foot-slab, and there was a space of four inches between the skull and the upright head-stone of the chest. The skeleton to the west was not so long by two inches, but the bones of the legs and arms as also such portions of the skull as came away whole were much thicker and stronger.

The two head-slabs were next removed. Behind the eastern body were some remains of pottery and the legs of an iron tripod one, of which came away whole. The earth being further removed northward, a portion of a skull appeared which could not be got out entire. There were no other bones with it, and the head appeared to have been placed on the top of the earthen vessels with which the space was filled. Could this single skull have been the head of a person sacrificed at the funeral rites of the skeleton? I can give no other supposition than that it was; no such head appeared in any of the other tombs, and it may have been, from the evident care bestowed on the formation of this grave above the other small ones, that its occupants were persons of some consequence.

I did not attempt further excavations, as I considered that enough had been done to establish the identity of these remains with those of similar classes elsewhere. Whether this has been the case or not I leave those to decide who may be better judges in such matters than myself. But the following is a brief recapitulation of the principal points, not only as regards Cromlechs and Kistvaens, but as regard the Cairns at Jiwarji.

1st. The Cromlechs are exactly of the same construction with those of Europe and the Nilgherries, the sizes of the largest tallying with the principal ones which have been examined and measured elsewhere. They do not, as far as I have opened them, contain funeral remains, and therefore may have been Temples or Altars only for the performance of sacrifices or other ceremonies. The fact of their being associated with Kistvaens and Cairns in the same cemeteries,

may give strength to this supposition. The traditions regarding those erected by dwarfs or fairies are identical with those of Europe, the Nilgherries &c.

2d. Kistvaens or closed Cromlechs. These also are identical with those of Great Britain and the Nilgherries, &c. They have all contained earthen urns, which have been filled with human ashes and bones mixed with charcoal, agreeing with the results obtained in England and in the Nilgherries. No idols or images have been found in any opened, nor have the urns had figures for handles or tops, but the colour of the earthen vessels is the same. The circular aperture in one of the monolithes of the Kistvaens, agrees entirely with that elsewhere noted, and is a remarkable feature in their identification.

3rd. Cairns and Barrows. These supply the same points of identification and resemblance with others. They are invariably round, and have either single or double circles of large stones or rocks round them. The centre is invariably elevated and consists of loose stones filled in over the earth of the grave below, to a depth of 3 to 4 feet. The graves contain stone-chests or coffins, or neat slabs of stone placed so as to form chests or coffins, covered by transverse slabs. These chests contain one or more bodies with earthen urns &c. on three sides, east, north and west; none have been found to the south, or towards the feet of the bodies. Portions of spear-heads and other iron weapons have been discovered with the urns laid by the side of the bodies, but no images or idols as in some of the Nilgherry Cairns, nor any rings or brass vessels. The bodies are interred at a great depth from the surface varying from eight to ten feet.

Other particulars might perhaps be mentioned, but enough has been stated to prove I think the position I have assumed. The grand question now remains as to whose these monuments were. I have little doubt myself that they were those of nomadic tribes of Druidic Scythians who penetrated into India at a very early period and who must have formed local settlements in various parts, the last of which were probably in the Nilgheries. Some speculations have been made that these were the remains of Jains or Buddhists, but we know the modes of sepulture in both castes to be entirely different

from these, (and that arms were never buried with their dead), and had they been Hindu or Buddhist it would have been impossible that they should not be much more numerous than they are. They are not sepultures of Hindus, who usually bury (where they bury,) in a sitting posture, while those distinctive marks separate them from all other tribes except those who are acknowledged to be Druidical.

There has been I am aware much speculation on the subject of invasions of India by Scythic tribes from central Asia, and the theories of Colonel Tod and others on the subject in regard to their amalgamation with Hindoo tribes or identity with them must be familiar to all. We have however no trace of them subsequent to the invasions of Alexander. But Mr. Elphinstone quotes various authorities in regard to their invasions into India and partial occupation of the country in remote periods of antiquity. There can be little to affect the supposition or presumption that these people so far removed from their native land, may have become, as they settled, gradually mixed with the aborigines of the country and absorbed with them into the Hindu and Buddhist masses; and their funeral monuments are therefore interesting as shewing how far they penetrated into India, where they settled and how far they observed the rites and ceremonies of their ancient faith, in correspondence with the Druidical remains of Western Europe, and links which are found to obtain between, —westwards and eastwards.

I have no knowledge of these remains in the central portion of India beyond those I have now described. I have heard that Cairns have been met with near Hydrabad, but am for the present entirely ignorant of their situation and number, and also whether they are accompanied by Cromlechs and Kistvaens or not. I myself have never observed any elsewhere; but that they may exist in greater numbers than these to the south and southwest may be inferred perhaps from the account of the remains at Yemmee Good, which may have been the great cemetery of the whole of this portion of India. Hindus collect the ashes of relations and carry them to the Ganges from all parts of India, and why not the Druidic Scythians to such places as were esteemed sacred by their tribes, which, from their nomadic character were, probably, widely scattered.

Note by the Secretary.—On the southeast coast of Arabia in lat. 16° 55′ N. and long. 54° 5′ E., is the small cape called Ras Resùt which protects a bay of the same name from the southwest monsoon. It forms the western extremity of the famous district of Dofar. This cape is about two hundred feet high and about half a mile broad, and is narrowed at its extremity, which is prolonged into the sea by a small island or rock. It is composed of the white and gray limestone of the coast, and is much scarped, and irregular on the summit from denudation.

On its extremity are the remains of a small round tower of rude construction, and heaps of stones, the ruins of former buildings, equally rude. The latter extend over an area of two acres, and are limited by a wall across the cape which formed the defence of the place.

About half a mile from the latter, still on the ridge of the cape, comes an ancient Burial-Ground, extending over an area of three acres. The graves are marked by nothing but a circle of large boulders surrounding a heap of loose stones, or what formerly was a heap of stones, sunken in the centre. The larger of these graves measure from six to twelve yards in diameter, and are raised two feet above the level of the plain. They are formed of blocks of white and gray limestone gathered from the immediate neighbourhood. Around the larger graves are smaller ones looped on to their circumference indicative of successive additions to them, of less distinguished members of the family or tribes perhaps, unless they all perished in battle and were buried at the same time.

We endeavoured to raise the stones from the centre of one of these graves, but after discending about four feet and a half below the surface of it, they became so large and so locked in, that although we had three or four stout Sidis and a good crow-bar we could not move them, and had we succeeded, the chances are, from the hurried way in which we were obliged to make our examination, that we should have found little to have rewarded us for our pains.

Besides this Burial-Ground and the ruins mentioned, there were the remains of buldings in all directions about this cape, although there is not a human habitation now within ten miles of it. Hardly any of these

remains amount to more than the few stones which mark the area occupied by the original building.

The graves as well as the heaps of ruins at this cape were overgrown with the Moql tree, and its congener, the *Balsamodendron pubescens* described by Dr. Stocks, also the Miswak threads its way abundantly through the crevices of the boulders. In many places the trunks of the two former measured four or five inches in diameter, and their branches gowing horizontally from their exposed position had extended completely over some of the larger graves. This shews that both trees and graves are very old.

At Damkōt, (lat. 16° 39′ N., and long. 52° 52′ E.) in the Bay of el Kammar, there is a very extensive Burial-Ground in which there are many ancient graves exactly like those at Ras Resùt, and what is curious, is, that they are mixed up with the more modern ridges of the Mahomedan graves. The latter most probably commenced with the introduction of Mahomedanism, while the former were the graves of the old Pagans.

Damkōt is a very ancient looking place, it is a kind of sea-hollow so to speak, with mountainous scarps on all sides, except towards the sea. A narrow gorge leads up into the interior from behind it though which the Bedoins come to it. It must have been the port of barter or trade of the tribes of all this district from the beginning, for there is no other.

The above is extracted from notes taken during the late survey of the southeast coast of Arabia. I am almost certain that I saw the same kind of graves also at a place on this coast called Marbāt, and on the top of Jibel Qarrah over the town of Makalla, where there is also an old Burial-Ground.

Lieutenant Cruttenden thus describes the same kind of graves in the Somali country. (Transactions of the Geographical Society of Bombay, Vol. VIII. Part 2, p. 207.)

"The graves found in the Somali country generally, and especially amongst the tribes of the Ahl Oor Sangeli, are remarkable for their neatness, being built of white slabs of limestone, almost marble, and surrounded by a circle of stones, the space within being neatly gravel-

led; but at Bunder Khor, in the Mijirtheyn territory, and in the neighbourhood of Berbera, very ancient graves are found consisting of heaps of stones, frequently seven to eight feet in height, and fifteen to eighteen feet in diameter at the base, hollowed in the centre, and with no head-stone; similiar in all respects to those described by Mr. Richardson in his "Travels in the Great Desert of the Sahara." They are, I fancy, relics of the Galla tribes, who once resided on the coast, but we could obtain no information respecting them."

Hence it would appear that this description of grave is to be found in every quarter of the old continent. C.

ART. III.—*Observations on the Grammatical Structure of the Vernacular languages of India.* By THE REV. DR. STEVENSON.

No. 3.

THE ADJECTIVE.

The Adjective is generally considered to be an essential part of language, as we require to have expressions for the qualities of things as well as names for the things themselves. Such qualities then as are obvious to the senses, as *black, white, straight, crooked, high, low,* and those which naturally suggest themselves to the mind from the consideration of the inherent properties of the persons and objects with which we come in contact, as *good, bad, useful, useless*, must have names in all languages. Accordingly, by all who have written on subjects of the Grammar of the Vernacular Indian tongues, Adjectives are allowed a place, except in the Carnatica Grammar referred to at the commencement of this series of papers. But no good reason can be given why करि (kari) *black,* should not be a word by itself, though it can be used in the form of करिदु (karidu), for a *black thing.* The word कृष्ण (Krishna), may be used before a noun in Sanscrit without any termination, if the writer pleases, but no one would say that then it was not an Adjective, meaning *black,* but the noun कृष्ण (Krishna),

which means *a black man*, deprived of its termination and used adjectively. In English we manage to get over the difficulty by prefixing an article, and the adjective black in the form of *a black* becomes a substantive; though even we admit that the latter is derived from the former. Be this as it may, in the Tamil, Malayalim and other southern languages, adjectives, as a general rule, have no declension except when they are used as nouns. And even when they have particles added to them, they do not vary these according to the gender and case of the nouns to which they are attached. The rule, in a word, is the same as in the Turkish, that adjectives have no declension. In the Sanscrit on the contrary, as is well known, adjectives as in Greek and Latin, agree with their substantives in gender, number and case.

Between the practice of the southern family and the Sanscrit in all of the northern family, except the Uriya which in this adopts the rule of the southern, a middle path is pursued. Adjectives ending in certain vowels only, agree in gender and number with their substantive in the nominative case. For all the rest of the cases they have one termination which does not vary. In Hindi, adjectives which are declinable have आ (*á*) in the nom. masculine, ई (*í*) in the nom. fem. and ए (*e*) in the oblique cases of the masculine, while the fem. keeps ई (*í*) throughout. No change takes place for number, so that these terminations serve for all oblique cases both in the singular and the plural. A similar rule holds good in the Bengálí, Gujarátí, Maráthí and Panjábí. In the Maráthí there is no change even for gender, ए (*e*) in the Provinces below the Ghauts, and या (*ya*) in those above them serving for all the oblique cases of three genders and two numbers. The same observations apply in a good measure to the Sindhí, though there the penultimate vowel varies occasionally for Number and gender. It is pretty evident then that the southern family of Indian languages follows a rule entirely different from the Sanscrit family of languages and agreeing with the Turkish, while the northern family through Bráhmanical influence has been partially and only partially conformed to the sacred dialect.

The comparison of adjectives is another important article in Comparative Grammar, where all the vernacular languages without one

single exception, desert the Sanscrit, and adhere to the Turkish model, which in this agrees with the Hebrew, and all that family of languages. The rule in all, is that no change should be made on the adjective for comparison, but that the simple adjective with the ablative case of the thing compared, should stand for the comparative degree, and the same with the words *above all* for the superlative; or else that particles corresponding to our words *very, excessive,* &c. should be joined to the adjective. In Yates' Bengali Grammar indeed the Sanscrit terminations तर (tara) and तम (tama) are mentioned as being occasionally appended to adjectives; but this usage is confined to learned Bráhmans, and a few of their imitators, and cannot be said to form any part of the language of the people. With all the simplicity and want of grammatical involutions that characterize the English tongue, we have not laid aside the marks for the degrees of comparison. The vernacular dialects of India then, have in this respect less title to be classed in the Indo Germanic family than the language of a people inhabiting an island beyond the extreme point of the European continent.

NUMERALS.

The subject of Numerals has been generally considered a very important one, nevertheless the words and signs representative of Numbers do not fix themselves so deeply on the mind as those that relate to the common objects that meet the eye, and the most intimate relations of life. We find accordingly, that there is no analogy between the names of numerals in northern and southern India. Sanscrit words, and their corruptions alone are used in the languages of the north. Those of the south belong to their own peculiar family. Nevertheless *onnu* one, may be connected with the Latin *unus*, also *yeradu* two, with the Armenian *yergu* and *aru* six, with the Turkish *alti*. *Yettu* eight, also may be an exception to the general remark, and be allied not only to the Latin *octo* but to the Sanscrit *ashta*. Connected with the subject, however, a most important enquiry opens upon us. It is, where were the common numeral figures now so generally diffused through the world first invented and used? Europeans lay no claim

to the invention for themselves, but attribute it to the Saracens by whom this numeral system was first introduced into the European continent. The Arabians, however, call these cyphers Indian, and write them from left to right the same way as the Indians write though contrary to their own practice in other cases.

Almost all ancient nations used the letters of the Alphabet as signs for Numerals. This was the practice of the Greeks, of the Hebrews, of the ancient Arabs, &c. At first it was considered sufficient to use the first letter for 1, the second for 2, and so on to the end of the twenty-two or twenty-four letters of the alphabet. The inconvenience and imperfection of such a notation were soon felt, and the first ten letters were then used to mark the numbers to 10, the letter following was used for 20, the next for 30, and so on to 100. The letter that followed next, denoted 200, and so the system proceeded onwards to 1000. The ancient Greeks, Arabians and other ancient nations, west of India, never proceeded beyond this step, and even the Tamulians to this day use a system essentially the same. This too seems to be the system of the Gujarát copper-plates, a system which prevailed in India about the beginning of our era. In this system the grand defect is that the characters denoting 1 and 10 and 100, &c., are all different and hence arithmetic remains clogged with great unnecessary difficulties. The grand invention was the adoption of the present decimal notation in which one unit, one ten, and one hundred are represented by the same character, and the difference of value made to depend on the place which the figure occupies nearer to or further from the beginning of the series. It is a curious matter of enquiry to ascertain whence this system was first introduced, and in the oblivious absence of all testimony, the only clue to the discovery seems to be to ascertain where an alphabet containing these numerals at present exists. It is thus taken for granted that the Indian numerals like the ancient Greek, Hebrew, Arabian, &c. are letters and not mere arbitrary marks. This in itself is certainly probable, and the probability will amount to a moral certainty if we show that in the great mercantile marts on the Indus, these very characters serve both as letters and numerals to this very day, and that they are easily explainable

from a reference to the alphabet of the Scindians of Hyderabad and Shikarpore.

The Indian system was not like the Ancient Greek and Arab however, a mere arbitrary imposition of a numeral value to letters from the position they chanced to have in the alphabet, but the first consonant of the word expressing the name of the numeral was chosen and made the figure to denote it. In reference to one, three, four five, six, eight, and nine no practical difficulty occurred to occasion any variation from the plan. The cyphers accordingly marking all of these numbers in the North of India, except the first and the last, are most of them altogether indentical with the Scindian letters and the others so nearly so as to show at a glance the connection. The resemblance between the first and last is not so striking, and had they stood alone might have been doubted altogether. In reference to the figure denoting seven, practical difficulty occurred. Its first letter corresponding to our *s* is so like the two figures that mark 1 and 5, that had it been adopted it would have been almost impossible to distinguish 7 from 15; the last consonant in this case has therefore been taken in its stead, and the cypher marking 7 is identical with the soft *t*, the त of Devenagari. This *t* was not needed for three, as in the Scindian language the word for three is written in that Alphabet ٹ pronounced *tre* which in Scindian is written ٣ as will appear from the table. Another practical difficulty remained to be got over. The word for two is *ba* and for zero *budi*, both beginning with the letter *b*. In the Sanscrit from which indeed all are ultimately derived, this ambiguity does not exist, and the word for two, *dvi*, begins with *d* and the word corresponding to *budi* or zero, is *vindu* beginning with *v*. These then were adopted, and the likeness in these two cases of *d* and *v* to 2 and 0 is most striking; besides *duo*, the very same as the Latin word for two, is itself a Scindian word and used in particular relations for two, nor could a man of any learning hesitate for a moment in the substitution of so easy a word as विन्दु *vindu* when it served a useful purpose for the more common vernacular term. I think then, from the consideration of all the circumstances of the case,

that it is plain our cyphers had their origin on the Banks of the Indus, and that this notation which has had such an influence, not only on commercial arithmetic but also on the science of Astronomy itself, was invented in India, and carried by the Arabians westward and thus passed into Europe. It is true the cyphers of different nations vary considerably in form, but I believe the learned have long been agreed that they all derive their origin from one source and that source I think from the circumstance of the correspondence of the cyphers with the first consonant of their name in the Scindian alphabet, may without any great stretch be assumed to have had their origin at no very distant period on the Banks of the Indus; what that period was it may be difficult to discover, yet I think it could not be earlier than the fifth or sixth century of our era. The Scindian letters from which they are taken are all easily derivable from ancient forms of the Nágari, but they approach so near in many instances to the modern Gujarátí, that they cannot be very ancient. Had there been moreover any thing of the kind in ancient India, it could not have escaped the research of the Greek traders who had so much intercourse before the rise of Mahommedanism with Western India and thus have been by them communicated to us, but I am not in a position to trace back the use of cyphers so as to show either when they were first used in Arabia or India. For Europeans not much accustomed to the writing of eastern languages, it may be proper to remark, that the common Scindian writing like the Persian and Arabian is almost entirely destitute of marks for the vowels. When the vowel is initial, one character is used which stands for the whole class, and when it follows a consonant, there is usually no mark for it all. Those who write short-hand, will understand how any one can read such writing, others will hardly be able to comprehend how it can be legible. Still such is the fact, and it is evident, that it never would have answered in such a thing as the formation of a numeral notation, with no context for our guidance, to have taken the vowels into consideration. In the following table, there is first the Scindian name of the numeral, next the consonant from which the cypher is derived, next the Scindian numeral cypher, and in the

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following columns the numeral cyphers of Northern India, Arabia and Europe respectively. In conclusion it is right to add that my own knowledge of the Scindian being purely elementary, I have followed closely Captain Stacks' Grammar and Dictionary of the language lately published by the Bombay Government.

The Scindian Numerals in words.	The Scindian letters from which the cyphers are derived.	The Scindian Numeral figures.	The North Indian Numeral figures.	The South Indian Numeral figures.	The Arabic Numeral figures.	The European Numeral figures.
एको Eko,	٢	१	१,१	٢	١	1
दुओ Duo,	२, २	२	२, २	٢	٢	2
ट्रिको Triko,	३	३	३	३	٣	3
चौंको Chauko,	४	४	४	४	۴	4
पंजो Punjo,	५	५	५, ५	५	٥	5
छको Chhako,	६	६	६	६	٦	6
सतो Suto,	७	७	७, ७	७	٧	7
अठो Atho,	८	८	८८	८	٨	8
नोंओं Noo,	٩	९	९, ९	९	٩	9
बिन्दु Bindu,	०	०	०	०	٠	0

ART. IV.—*Observations on Inscriptions on Copper-Plates dug up at Neru'r in the Ku'dal Division of the Sa'want Wa'ri' State in April* 1848. by MAJOR LE-GRAND JACOB (Communicated by the Government.)

These inscriptions are in what has been termed the cave character or the old Sanscrit, and are of the sixth and seventh centuries A. D. but they do not differ much from the Gírnar inscriptions of the 3d century B. C.—a table explanatory of, and showing the varieties in, these letters is annexed to the translations.

2. The plates all refer to the Chálukya or Chálikya race, the name is therein spelled both ways; the earliest recorded date, is S'áliváhana S'áka 627 A. D. 705—6, the Donor, Vijayáditya son of Vinayáditya; this plate has been numbered II, the earliest inscription appears to be that numbered I, describing a grant by Vijayábhaṭṭárika the beloved wife of Sríndrátiya elder brother of Vikramáditya, father of the above named Vinayáditya, and was therefore written three generations previously; whether Sríndrátiya, or as would appear the more correct name Srí Chandráditya, * reigned previous to his younger brother, jointly with him, or not at all, is left in doubt, but from the title applied to him, and from the royal boon bestowed by his wife, one of the two first alternatives appears probable, hence as the era of Vikramáditya's ascension to the gádí has been shown by the Kánerese inscriptions translated by Walter Elliot † to have been S'áka 514 A. D. 592—93, this plate must have been written about the close of the sixth century.

3. Vijayáditya's grant (No. II Plate) was made in the tenth year of his reign, thereby corroborating the era assigned for its commencement by Mr. Elliot, but the genealogy of this dynasty slightly differs

* Since completing these translations another set of plates has been found recording a grant by another wife of this same Prince whose name is written Sri Chandráditya, the letter *Cha* seems therefore omitted by oversight in this plate. See Inscription No. VIII.

† Article, 1 July, 1836. Vol. IV. R. A. S. Journal.

from his in both these plates, which correspond one with the other as far as the eras reach. They both commence with Pulakes'i, and as they were evidently written when the grants were made, they would scarcely have omitted two whole generations between him and their own period; perhaps therefore the "Amara" and "Aditya Varma" of the comparatively modern Ye-ur Inscription, succeeding Satya,* were if existing at all, this soveriegn's brother as Chandráditya was of Vikramáditya, or otherwise alias names, in after years taken for separate Rulers.

4. The genealogy and titles of the family as gathered from these two plates, are as follows :—

Ancestor of the race.
Háriti descended from Manu.
Srí Pulakesí Vallabha, Mahárájá.
|
Srí Kírrtivarma Prithiví Vallabha, Mahárájá.
|
Satyás'raya Srí Prithiví Vallabha Mahárájá.
Adhirájá Parames'vara.

Srindráditiya (or the name would more correctly appear to be Srí Chandráditya) Prithiví Vallabha Mahárájá.	Vikramáditya Satyásraya Srí Prithiví Vallabha Mahárájá Adhirájá Parames'vara Bhaṭṭáraka.

|
Vinayáditya Satyás'raya Srí Prithiví Vallabha, Mahárájá Adhirájá Parames'vara Bhaṭṭáraka.
|
Vijayáditya Satyás'raya Srí Prithiví Vallabha.
Mahárájá Adhirájá Parames'vara Bhaṭṭáraka
|
Vikramáditya. 2nd

5. The 3d set of plates names only two Rájás, Mangalá the Donor and his father Vallabha, of the Chálikya race, but whether of the same branch, or conquerors thereof, is left in doubt; the character appears of the same age as the others; perhaps this

* Throughout these plates written Satyás'raya, "Truth Asylum."

Mangalá, is Mangalisa, the son of Pulakes'i, also styled Vallabha, the first named of the dynasty, and if so, this inscription is older than No. I. set, by two generations—the only place in these grants that I can recognize, is that named in this plate Kundivádaka, probably the modern village of Kundé, not far from Nerúr, where the plates were exhumed.

6. The most interesting passage, is in No. II, where Vingáditya is described as having conquered the Ruler of Kánchi (Conjeveram) forced the Lords of the Islands Kumara, Párasíka, and Sinhaba, to pay him tribute, and subdued all the Northern Countries as his Father Vikramáditya previously had the South. Can this dynasty have reached at the same time both Persia and Ceylon? Or what are these places? These words may also in the construction of the language imply the names of the Island Rulers, as well as of the so called Islands.

7. Being very imperfectly acquainted with Sanscrit, I should not have been able to master these inscriptions, nor have found time to devote to them, but for the aid rendered me by Vásudev Rámchandrí Shástrí, and an intelligent young Bráhman trained in the Elphinstone Institution by name Ananta Ballál.

8. I do not understand how Mounstuart Elphinstone whilst quoting Walter Elliot's researches, should have assigned the tenth century for the rise of the Chálikya dynasty, nor why Bál Gangadhar Shástrí, in his translation, or I should rather say Maráthí edition * of this history, omitted to rectify the mistake, since he had himself translated some inscriptions (published in the Vth. and VIIIth. Nos. of the B. R. A. S. Journal) whereby he had "verified the names of some of the early Kings of this race."

9. The system of Orthography used in representing Sanscrit in English letters has been that adopted by the Asiatic Society.

PLATES.

No. I. Be it peace. The prosperous race of the Chálukyas; the sons of Hárití, of the lineage of Manu, praised by the world; brought up

* Published 1846.

by the mothers (1) of the seven nations; who obtained choice blessings through the protection of Kártika; who brought all kings under their allegiance, from the time of their obtaining the boar's signet through the grace of the Divine Naráyana—The great king Pulakesí Vallabha, the ornament of the race, purified himself by the sacrifice of a horse and consequent abluent rites. His great-grandson, the grandson of Kírttivarma (lord of the earth, the great king, who, having subjugated and forced his enemies to take refuge in forests, &c., firmly implanted his pure fame amongst them), the beloved son of Saytás'raya (lord of the earth, king of kings, ambitious of supremacy, devoted to war, to whom all kings paid homage, and who gained by the defeat of S'rí Harshavarddhan, famous in the Northern countries, the name of Parames'hvara) is the unconquerable (2) Vikramáditya. His elder brother S'ríndráditya, lord of the earth, the great king, whose beloved wife, Vijayabhattárika, the anointed Queen in the year Pardhomas (3) of her family's reign, on the autunmal equinox, the 2d day of the waning moon of A's'vin, (September and October) for the attainment of the virtue of a deed done on this day, bestowed along with water, the privilege of supervision (i. e. benefice) of the eight markets Poliyamapatha, Adigirika, &c., in (Narakágár), on A'ryaswámí—Díkshit (a sacrificer) grandson of *Grihapati*, a descendant of Vatsa, and son of (4). The Donor says "he, who will continue this privilege to be enjoyed by the future generations of this person, will be like the donor, an enjoyer of virtue; while on the other hand, whosoever may deprive him of it will be guilty of the five capital crimes—The same is even prescribed by the omniscient Vyása, who says "whosoever resumes what is given by himself or others shall be doomed to pass sixty thousand years in hell."

No. II. May it be well. Glory be to the boar-like body (5) in whom *Vishnu* was made manifest, who agitated the ocean, and on the tip of

(1) The seven divine powers typified by female Deities. (2) A few words before this are illegible. (3) The letters are plain but the signification unknown. (4) Name is illegible. (5) The third incarnation of Vishnu, for the recovery of the earth from the waters.

whose right, erect tusk rested the world. The prosperous race of the Chálikyas (1), sprung from the universally praised lineage of *Manu*; the sons of Hárití, brought up even by the seven nations' mothers (i. e. by the seven female deities, Brámhí, Mahes'varí, &c., or by seven mothers like Lakshmi); who obtained a succession of blessings through the protection of Kárttikaswámi (2); who brought all the kings under their allegiance from the time of their obtaining the boar signet through the grace of the Divine Naráyana. This race was ornamented by the great king Pulakes'i Vallabha who purified himself by the sacrifice of a horse, and consequent abluent rites. His son, the great king Kírttivarma, lord of the earth, having subdued and forced all his enemies to take refuge in forests, &c., firmly implanted his pure fame amongst them. His son *Satyás'raya* (3) lord of the earth, and king of kings, much devoted to war, and to whom all kings paid homage, gained by the defeat of S'rí *Harshavarddhan*, hero of the northern countries, the name of Parames'vara (4). His beloved son Vikramáditya, father of intelligent sons, lord of the earth, and king of kings, desirous of supremacy, supported by a harmonious brotherhood, whose lotus-like feet were kissed by the crown of the despotic king of Kánchí (5) subdued all his rivals on one horse alone, the excellent Chitra-Kandha, (6). His beloved son Vinayáditya, lord of the earth, and king of kings, desirous of supremacy, disabled as Tárakáráti (i. e. Skanda) did the Daityas the insolent forces or *Dhuerajyu* king of Kánchí; he made the rulers of the Islands, Kumera, Párasíka, Sinhaha, &c., pay him tribute and gradually acquired the full symbol of supremacy, (Pádídhvaja, &c.,) by the overthrow of the kings of the northern countries. His beloved son Vijayáditya, lord of the earth, and king of kings, desirous of supremacy, attained even in his childhood, the whole science of rendering weapons efficacious by charms. His grand-father (Vikramáditya) had conquered the kings of the South,

(1) In this and all the plates save Nos. 1, & 4, the word is wriiten Chálikya. (2) The son of Mahádeva and Commander in Chief of the Celestial forces. (3) Literally, Truth-Asylum. (4) The kings succeeding Satyás'raya henceforth bear in the plate, both his name and the new title acquired by him in addition to their own. (5) A few words before this are unintelligible. (6) Literally means many colored neck.

but he exterminated all of them who were inimical to him, and after the death in battle, of his father (Vinayáditya) who made conquest of the northern countries, he, moving about at will, got his scymitars' edge blunted by the slaughter of his enemies' numerous elephants. He, foremost in battle (1) ardent in noble enterprises, made all his enemies subject to him (2). No sooner did he hear of anarchy than he left his house, like Vatsarájá (i. e. Udayana of the solar race) relying on his own power, removed this source of misery in the country, and the excess of every vice, which had arisen from the oppression of Bráhmans, a royal calamity; giving protection to all his subjects by the strength of his arms. He is arbitrary, at all times possessed of the three royal attributes (i. e. [illegible]y, Policy, and Energy). He humbled the pride of his enemies, but he himself cannot be mastered. He is spotless, and for all this is become all the world's support. His dominions, adorned by all the symbols of supremacy (Pádídhvaja &c.,) are extensive. He commands thus. "Be it known to you that we, in S'ák'a 627, the tenth current year, *Pravarddhamán* of Vinayáditya's, reign, at the request of *Dupendra* (3), granted Kumára (4), in the country *Mahásaptami* (5), to the best and amiable Bráhmans, inhabitants of the village of Hikudhamba (6), who have penetrated through, the Vedas and their branches. We mention their names and lineage-viz. Deva Swámí, a descendant of Bháradwája, Karka Swámí, a descendant of Kaus'ika, Yadam Swámí, a descendant of Bháradája Swámí (7), a descendant of Kaundinya; Deva Swámí, a descendant of Maudgalya; Gargga Swámí, a descendant of A'treya; Rudra Swámí a descendant of Kás'yapa; and Rasuvarman, a descendant of Vatsa. Knowing that life and wealth are transient, as glittering sunbeams, our successors or other kings, who may thirst for fame, enduring as long as the world, the moon, and the sun exist, should protect this grant as their own child. It is prescribed by the omnis-

(1) The words also imply first in beauty. (2) Some words being entirely effaced, the connexion is here broken. (3) One letter preceding Dupendra is illegible. (4) Four letters following Kumára are illegible. (5) Two letters here are doubtful. (6) Three letters preceding Hikudhamba are illegible. (7) Three letters preceding Swámí are unintelligible.

cient Vyása too, that many kings, Sagara and others have enjoyed the earth; to whomsoever the earth belongs; to him belongs the fruit thereof. It is easy for the great to grant wealth once, but it is difficult to preserve what others have given, therefore the latter is a more meritorious act than the former. He who resumes what is given either by himself or others, stays sixty thousand years as a worm in hell." The unblemished Punga Vallabha, most prudent in suggesting the time of peace and war wrote this edict.

No. III. May it be well. The king Vallabha, belonging to the wealthy Chalikyu race, the offspring of Hárití, descended from the children of Manu and constantly meditating on the feet of Swámí Mahásena (i. e. Kártikeya), well versed in the institutes of Manu, the Puránas, Rámáyana Mahábhárata, and ancient history; Vrihaspati in Ethics, purified himself by the ablutions made after the Agnishtoma, Wájapeya, Paundaríka, and costly As'vamedha (a sacrifice of a horse) sacrifices, and rendered himself popular by his qualities. His son Mañgala Rájá is most attached to the Bráhmans, a subduer of other's territories, equitable in his own dominions and devoted to the worship of God (the gods) Bráhmans and his preceptor. His pure fame pervades the world. He, by his personal prowess, made other kings submissive and obtained tribute from them. His gait, sight, and voice are like those of a bull. He is uncontrolable as a lustful and high mettled elephant, brave as a lion, full of justice, humility, charity mercy, modesty, and truth; possessed of three atributes (i. e. Bravery Policy, and Energy); most pious, inimitable in good qualities, by the lustre of whose virtues the darkness of opprobrium is repelled. This illustrious king expelled Shañkaragan's son Budha Rájá, strong in elephants, horses, infantry, and treasure. He slew Swámí Rájá, a descendant of the Chálikya race, who had been victorious in eighteen battles. After this, the king, fasting on the most hallowed day in the year, the 12th day of (the waxing moon) Kártika, and worshiping Vishnu, spiritual mindedly granted with water, (1) Kundivádaka

(1) A ceremony observed previous to any donation, intimating the entire relinquishment of right over the thing given.

a village in the Koñkan, to Priyaswámí, descended from a respectable family, versed in the Vedas and their parts, good-tempered, well-beloved, the son of Sumati Swámí who understood the Vedas and their parts and was descended from Kás'yapa. Mañgala Rája said "any one either of my or other's family that may angrily, or maliciously or avariciously or foolishly withdraw the grant, will be guilty of the five capital (2) and also minor crimes." It is not he only that says so but even the Dharma S'ástra prescribes the same. Many kings, Sagara and others possessed the land. All rulers reap the fruits of their acts. Any one who takes back the land given by himself or others, stays as a worm sixty thousand years in hell. The land donor remains sixty thousand years in heaven; on the contrary, the depriver and his abettor dwell the same number of years in hell. It is easy for the great to grant wealth but it is difficult to preserve what others have given. Granting and preserving are both virtuous deeds, but the latter is more so than the former.

No. IV, is entire, having three Plates, like the others, in the set. There is no S'áka found in it. This Plate is very badly written and abounds in numerous graphical errors. Vijayáditya is the donor, but he gives it in his son's name.

No. V, has lost its third leaf. Its first leaf is greatly corroded. The few words that are legible from Swasti to Varttamáne, are a repetition of a part of Plate No. II followed by Rásavanagare, the last word. The donor is Vijayáditya—the grant is conferred in S'áka 622 in the 5th year of his reign.

No. VI, has two leaves, almost eaten away, the middle one wanting. The few words decipherable convey no meaning.

No. VII, is the upper part of one leaf. It contains the final S'lokas of the other Plates.

(1) 1st Slaughter of a Bráhman, 2d Drinking of wine, 3d Stealth of gold, 4th Incest with father's or Guru's wife; and 5th Drinking and eating with the perpetrator of any of these crimes.

No. VIII. The "Kochré Inscription" * translated as literally as consistent with the sense in English.

May it be well. The prosperous raee of the Chálukyas; the sons of Háritá, of rhe lineage of Manu, praised by the world; brought up by the mothers of the seven nations; who obtained a succession of blessings through the protection of Kárttika; who brought all kings under their allegiance from the time of their obtaining the boar's signet through the grace of the Divine Naráyana. The great king Pulakes'ivallabha the ornament of the race, purified himself by the sacrifice of a horse and consequent abluent rites. His great-grandson, the grandson of Kírttivarma (lord of the earth, the great king, who, having subjugated and forced his enemies to take refuge in forests &c., firmly implanted his pure fame amongst them) the beloved son of Satyás'raya (lord of the earth, king of kings, devoted to war, to whom all kings paid homage and who gained by the defeat of Srí Harshavardhan lord of the northern Countries, the name of Parames'vara) is Vikramáditya. He having subdued all the hostile kings of every quarter and inherited his family's property (throne &c.) rendered himself invincible by his paramount power. His elder brother was Chandráditya, lord of the earth and king of kings, whose beloved wife, Vijirayamahádeví (1) the anointed Queen, an enemy to the Kaliyug, thus publicly ordains "Be it known to you that on the 12th day of the waxing moon of..... (April and May) I, having fasted, bestowed along with water the Thikan Vakulakachcha, together with a salt marsh in Kochuraku village (modern Kochré) on Golaswámí (2) a descendent of Wutsu. Any one, either (3) of our or other's family, who will preserve the grant, will be an enjoyer of virtue; while on the other hand, he, who will resume it, will be guilty of the five capital crimes. The land Donor enjoys heaven for sixty thousand years; while on the contrary, the resumer, and the one who approves of the resumption are doomed to pass the same number of

* See the note to 2nd para. of Preparatory Observations. (1) Four following letters are unintelligible. (2) Four letters preceding the name are unintelligible. (3) A few letters before this are plain but their signification is unknown.

years in hell. Whosoever resumes land, given by himself or others, stays sixty thousand years as a worm in hell. (1) *

G. L. JACOB.

15th Nov. 1848.

(1) The final 10 letters are unintelligible.

* NOTE.—May we suppose that this Kírtti Varma is the same as the king at whose court the allegorical drama called. the Prabodha Chandrodáya was represented? A Kírtti Varma is celebrated both in the drama, and on the copper plates as a conqueror; in the former he is said to be "a sovereign of the race of the moon," and it is well known that the Chálukiyas were a lunar dynasty. In both instances the monarch's extensive Empire is celebrated. "The earth encompassed by the ocean is subjected to his authority, and he receives the homage of its kings." "Gopála whose glory fills the universe, who aided by his sword as his friend, conquered the lords of men, and has invested with the sovereignty of the earth Kírtti Varma, the chief of Princes. . . . now he has entered the road of peace, (Prabodha Chandrodáya, Prologue)." With this compare Journal of Royal Asiatic Society, No. VI. p. 268. "From him (Pulakes'i) arose Kírtti Varma Rájá superior to Rájá Nala, destroyer of the Rájás of the Maurya, and Kadambo dynasties who first caused the land to become well inhabited." This is from an inscription of the Chálukíya, called by mistake the Chámushya dynasty. See also No. VII, and X. p. 346. Vishnu in his boar incarnation is the chief object of worship both according to the plates, and the drama, and the language in which he is eulogized is in both instances the same inflated, artificial style which is common on plate inscriptions.

The frequent references to the *boar* standard and the use of a *boar* signet on the plates of the Valabhi and Chálukya dynasties remind us of our Anglo-Saxon ancestors. Tacitus says of the Æstyi that, in imitation of the Suevish custom "Matrem deùm venerantur, insigne superstitionis, formas aprorum gestant. Id pro armis omnium que tutela; securum deæ cultorem etiam inter hostes præstat." The Anglo-Saxon poems consider a boar's form or figure so essential a portion of the helmet, that they use the word "sofore" *aper*, for that part of the armour. "He commanded them to bring in the *boar* (i. e. helmet) the ornament of the head, the helmet lofty in battle." Beowulf 1.1299. And still more closely with reference to the virtues of this sign;"

"The forms of *boars* they seemed
above their cheeks to bear
adorned with gold,
various and hardened in the fire
it held the guard of life."

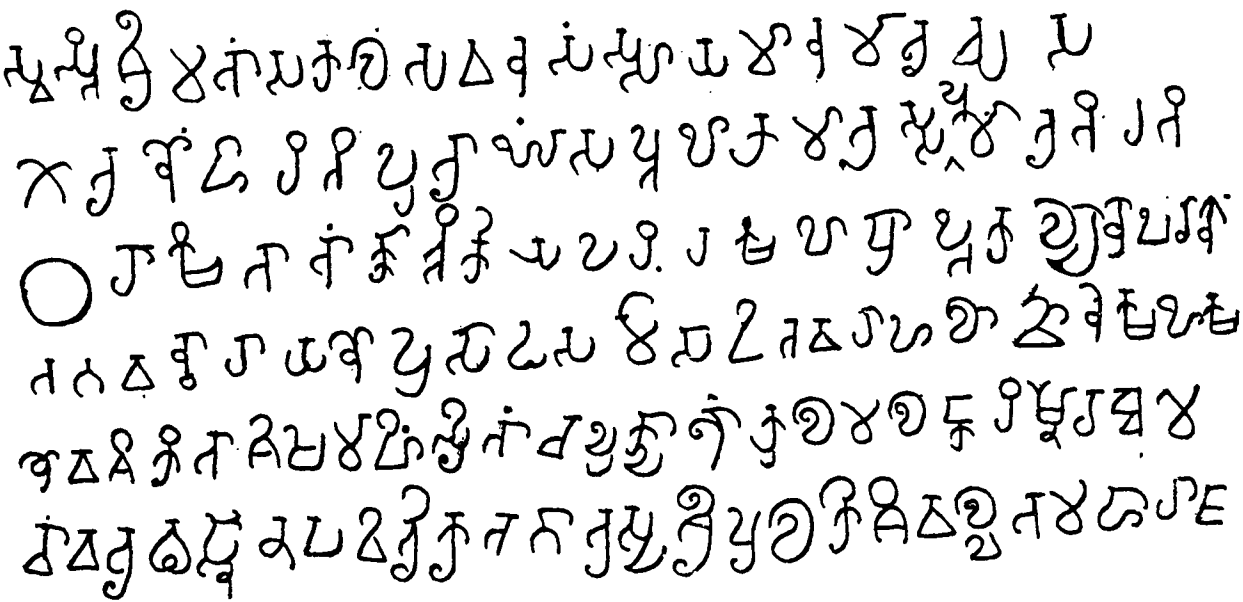
And again

"But the white helmet
guarded the head,
* * * *
adorned with treasure
set about with lordly signs,
as it in days of yore
the armourer made,
wondrously produced,
set it about with shapes of *boars*,
that afterwards neither
brand nor war-knife
might penetrate it."

This sign, Grimm connects with Freá who was similar to Vishnu in his amorous propensities and was worshipped with the lingum or phallus. See "the Saxons in England" by Kemble.

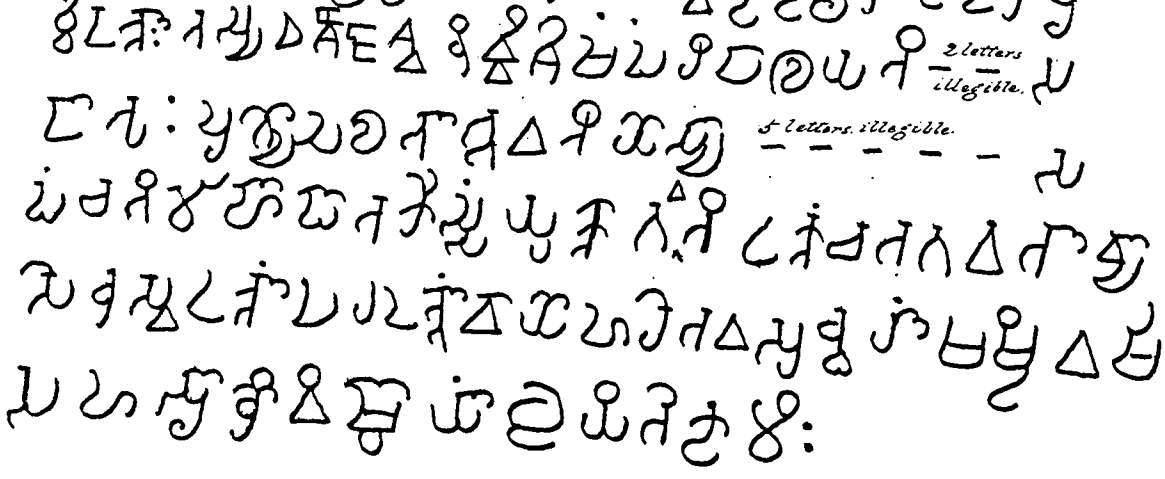
P. A.

Set of Plates No. I.



[illegible]

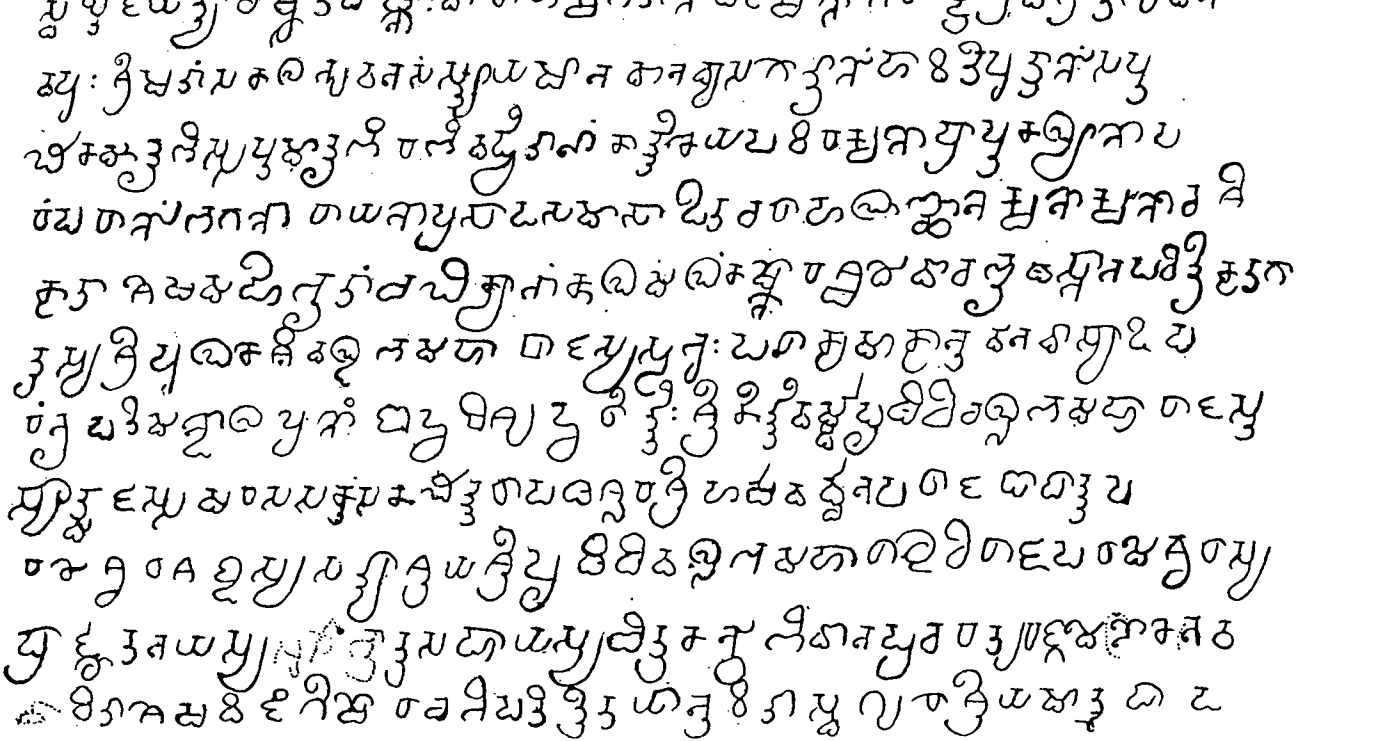
4 letters.


2 letters illegible.
5 letters illegible.

Transcript of No. I in Modern Nágrí.

स्वस्ति. श्रीमतां. सकलभुवनसंस्तूयमान मानव्यस
गोत्राणां. हारितिपुत्राणां. सप्तलोकमातृ स्सप्तमातृभिरभि
राक्षितानां. कार्त्तिकेय परिरक्षण प्राप्त कल्याणपराणां
भगवन्नारायण प्रसाद समासादित वराह लाञ्छने क्षणक्ष
णवशीकृताशेष महीभृतां. च लुक्यानां कुलमलङ्करिष्णोरश्वमे
धावभृथस्नान पवित्रीकृत गात्रस्य. श्रीपुलकेशिवल्लभ महाराज
स्य प्रपौत्रः पराक्र क्रान्तवनवास्यादि पर नृपतिमण्डलप्रणिबद्ध
विशुद्ध कीर्त्ति श्रीकीर्त्तिवर्म्म पृथिवीवल्लभ महाराजस्य पौत्रस्समा
रं संसक्त सकलोत्तरापृथे श्वर श्रीहर्षवर्धन पराजयोपलब्ध
परमेश्वरापरनामधेयस्य. सत्याश्रय श्रीपृथिवीवल्ल
भ महाराजाधिराज परमेश्वर भट्टारकस्स्य प्रियतनयो
राजरिपुनरेन्द्र हन्तादिशिजि - - - - - - - - - - -.
प्राप्य - - - - नमनिवारित विक्रमादित्य तस्य ज्येष्ठ
भ्रातुः श्रीन्द्रादित्य प्रथिवीवल्लभ महाराजस्य प्रियमहि
षीविजय भट्टारिकास्व राज्य पर्धोमस्संवत्सर आश्व
युजपौर्न्नमासस्य द्वितीयायाम् विषुवे बहुपुण्यार्त्थम्
नरकागाहरे वत्स सगोत्राय गृहपते पौत्राय स्वामिच
-रैवि - स्यपुत्राय आर्य्य स्वामिदि क्षिताय पोलियम
पथादि गिरिका प्रभृति दक्षिणोपरिश्वष्टाट्टेक्षिका उदकपू
र्व्वं दत्ताः तस्य वङ्गजेष्वनिर्व्विशेषं परिपालयति - - स
दातुः पुण्यफल भाग्भवति योस्य - - - - - स
पंचभिर्महापातकैस्संयुक्तो भवति उक्तंच भगवता व्या
सेन स्वदत्तां परदत्तां वा यो हरे तवसुन्धरां षष्टिवर्ष
सहस्राणि विष्ठायां जायते कृमिः

Set of Plates No. II.



ಕೃಷ್ಣ ಮೇನನ್ನು ಕುರಿತು ಮಾತನಾಡುವುದು ಸರಿಯಲ್ಲ ಎಂದು ಹೇಳಿದ ಮೇಲೆ ಅವನ ಮಾತಿಗೆ ಮರುಮಾತಾಡಲು ಧೈರ್ಯವಿಲ್ಲದೆ ಸುಮ್ಮನಿದ್ದ ಸಾತ್ಯಕಿ ಮತ್ತು ಕೃಷ್ಣ ಮೇನರ ಮಧ್ಯೆ ಸಂಭಾಷಣೆ ಮುಂದುವರಿಯಿತು. ಕೃಷ್ಣ ಮೇನನು ಸಾತ್ಯಕಿಯ ಕಡೆ ತಿರುಗಿ ಹೇಳಿದ: ಮಗೂ ಸಾತ್ಯಕಿ ನೀನು ಹೇಳಿದ ಮಾತು ಸರಿಯಾಗಿದೆ. ಕೃಷ್ಣ ಮೇನ ಮಹಾಭಾರತ ಯುದ್ಧದ ಸಮಯದಲ್ಲಿ ಹುಟ್ಟಿದ ಮಗ ಅಲ್ಲ. ಅವನು ಹುಟ್ಟಿದ್ದು ಯುದ್ಧ ಮುಗಿದ ಮೇಲೆ ಅಂದರೆ ಕೃಷ್ಣ ಪರಮಾತ್ಮ ಸ್ವರ್ಗಕ್ಕೆ ಹೋದ ಮೇಲೆ. ಕೃಷ್ಣ ಮೇನ ಹುಟ್ಟಿದ್ದು ಕಲಿಯುಗದ ಆರಂಭದಲ್ಲಿ. ಕೃಷ್ಣ ಮೇನ ಕಲಿಯುಗದ ಮೊದಲ ಮಗ ಅಂದರೆ ಕಲಿಯುಗದ ಮೊದಲ ಮಗ ಕೃಷ್ಣ ಮೇನ ಅಂದರೆ ಕಲಿಯುಗ ಪ್ರಾರಂಭ ಆಗಿ ಸುಮಾರು ಮೂವತ್ತು ವರ್ಷಗಳಾದ ಮೇಲೆ ಕೃಷ್ಣ ಮೇನ ಹುಟ್ಟಿದ್ದು. ಕೃಷ್ಣ ಮೇನ ಹುಟ್ಟಿದ ಮೇಲೆ ಕಲಿಯುಗ ಪ್ರಾರಂಭ ಆಗಿ ಸುಮಾರು ಮೂವತ್ತು ವರ್ಷಗಳಾದ ಮೇಲೆ ಕೃಷ್ಣ ಮೇನ ಹುಟ್ಟಿದ್ದು. ಕೃಷ್ಣ ಮೇನ ಕಲಿಯುಗದ ಮೊದಲ ಮಗ ಅಂದರ

ಕ್ರಿಸ್ತ ಶಕ ೧೮೮೦ ರಲ್ಲಿ ಮೈಸೂರು ಸಂಸ್ಥಾನದ ಮಹಾರಾಜರಾದ ಚಾಮರಾಜ ಒಡೆಯರ ಆಳ್ವಿಕೆಯಲ್ಲಿ ಮೈಸೂರು ಸಂಸ್ಥಾನದ ಮಂತ್ರಿಗಳಾಗಿದ್ದ ಶ್ರೀ ಕೃಷ್ಣರಾಜ ಪಂಡಿತರು ಮೈಸೂರಿನ ಸಮೀಪದಲ್ಲಿ ಒಂದು ಕೆರೆಯನ್ನು ಕಟ್ಟಿಸಿದರು. ಆ ಕೆರೆಯ ಕೆಳಗಡೆ ಸುಮಾರು ೧೦೦ ಎಕರೆ ಜಮೀನು ಇದೆ. ಆ ಜಮೀನಿನಲ್ಲಿ ಕೆರೆಯ ನೀರಿನಿಂದ ಭತ್ತ ಬೆಳೆಯುತ್ತಿದ್ದರು. ಆ ಕೆರೆಯ ಕೆಳಗಿನ ಜಮೀನಿನ ಒಂದು ಭಾಗದಲ್ಲಿ ಒಂದು ಕಲ್ಲಿನ ಕಂಬವಿದೆ. ಆ ಕಂಬದ ಮೇಲೆ ಕೆಳಗಿನ ಬರಹವಿದೆ.

ಶ್ರೀ ಕೃಷ್ಣರಾಜ ಪಂಡಿತರು ಕಟ್ಟಿಸಿದ ಕೆರೆ ಕೆಳಗಿನ ಜಮೀನು ೧೦೦ ಎಕರೆ ಇದೆ ಇದರ ಪೂರ್ವ ಪಶ್ಚಿಮ ಉತ್ತರ ದಕ್ಷಿಣ ಹದ್ದು ಕಲ್ಲಿನ ಕಂಬ

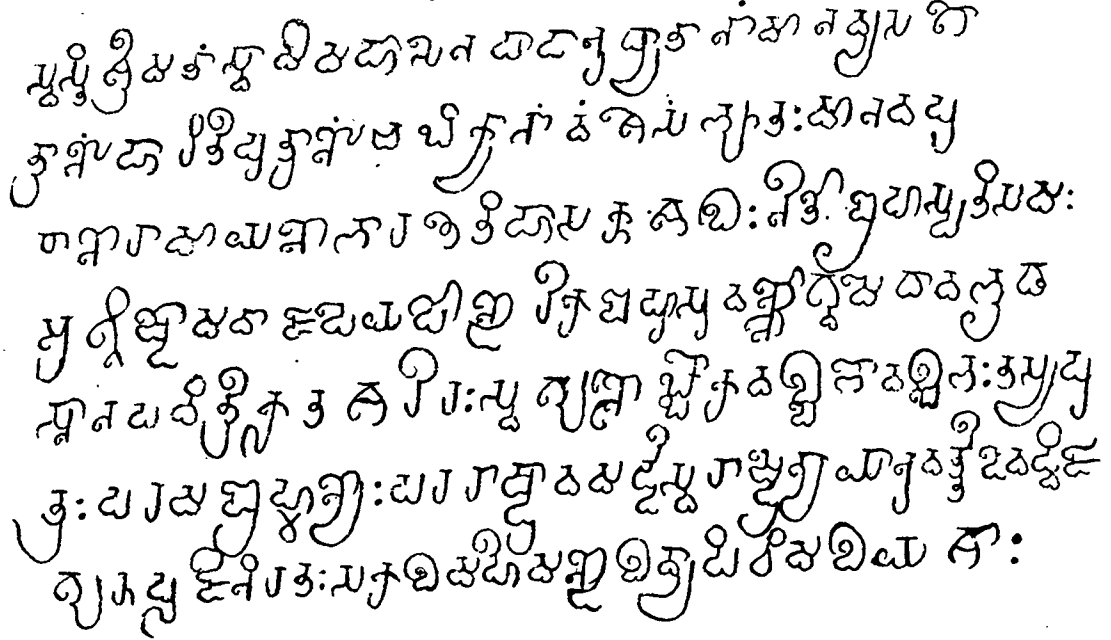
Transcript of No. 2. in Modern Nágrí.

स्वस्ति · जयत्याविष्कृतं विष्णोर्वाराहं क्षोभितार्णवं · दक्षिणोन्नतदंष्ट्राग्रविश्रान्तभुवनं
वपुः श्रीमतां सकलभुवनसंस्तूयमानमानव्यसगोत्राणां हारिनीपुत्राणां · सप्त
लोकमातृभिस्सप्तमातृभिरभिवर्द्धितानां · कार्त्तिकेयपरिरक्षणप्राप्तकल्याणप
रंपराणां · भगवन्नारायणप्रसादसमासादितवराहलाञ्छनेक्षणक्षणवशी
कृताशेषमहीभृतां · चलिक्यानां कुलमलंकरिष्णोरश्वमेधावभृथस्नानपवित्रीकृतगा
त्रस्य · श्रीपुलकेशिवल्लभमहाराजस्य सूनुः पराक्रमाक्रान्तवनवास्यादिप
रनृपतिमण्डलप्रणिबद्धविशुद्धकीर्त्तिः श्रीकीर्त्तिवर्म्मपृथिवीवल्लभमहाराजस्त
स्यात्मजस्समरससेक्तसकलोत्तरापथशूरश्रीहर्षवर्द्धनपराजयोपात्तप
रमेश्वरशब्दस्य · सत्याश्रयश्रीपृथिवीवल्लभमहाराजाधिराजपरमेश्वरस्य
प्राज्ञतनयस्य सुमोंभ्रात्रसहायस्य · चित्रकन्धाभिधानप्रवरतुरङ्गमेणैकेनैव
वारिताशेषविजिगीषोरवनिपतित्रितयानृविता स्वगुरोश्रीयमात्मपाद

स्य प्रभाव कुलिशदालित पाण्ड्यचो - - - - - - - - - - - विभ्रमस्यानन्यव
ननकाञ्चीपति मुकुट चुंबित पादांबुजस्य · विक्रमादित्यसत्याश्रय श्रीपृथिवी व
ल्लभ महाराजाधिराज परमेश्वर भट्टारकस्य · प्रियसूनोः पितुराज्ञा - - - विन्दु
शेखरस्य · तारकारातिरिव दैत्यबलमति समुद्ध न्धै राज्यकाञ्चीपति बलमव
ष्टभ्य · करदीकृत कमेर पारसीक सिंह हादि द्वीपाधिपस्य · सकलोत्तरा पथना
थमथनोपार्ज्जिनार्ज्जित पादि ध्वजादिसमस्त पारमैश्वर्य्यचिन्हस्य · विनयादि
त्य सत्याश्रय श्री पृथिवी वल्लभ महाराजाधिराज परमेश्वर भट्टारकस्य · प्रियात्मज श्शै
शव एवाधिगताशेषास्त्र शास्त्रो · दक्षिणाशाविजयिनिपितामहेसमुन्मूलितनिखि
ल कण्टक सहेतिरुत्तरापथविजिगीषोर्गुरोरग्रत आवधाहं व्याहारमाचरन्न
रातिगज घटापाटन विशीर्य्यमाण कृपाणधारस्समग्रविग्रहाग्रेसरस्स
त्साहसरसिकः परात्मनीकृत शत्रु मण्डलो · गंगायमुना पादि ध्वज पदम
- - - - - - - - - - - -

कामाणिक्यमतागजादिपितृसात्कुर्वन्धरै ॐ पलायमानैरासाद्य कथमपि वि-
धिवशादुपेतविप्रतापादेव विषयप्रकोपमराजकमुत्सारयन्वत्सराज
इवानपेक्षितापरसाहाय्यकस्तदेवावग्रहान्निर्गत्यस्वभुजावष्टंभप्रसवि
ताशेषविश्वंभरः प्रभुरखण्डितशक्तित्रयत्वाच्छत्रुमदभंजनत्वाद्दुर्धरत्वान्निरव
द्यत्वाद्यः समस्तभुवनाश्रयस्सकलपारमैश्वर्य्यव्यक्तिहेतुपाढिध्वजाद्यु
ज्वलत्प्राज्यराज्यो विजयादित्यसत्याश्रयश्रीपृथिवीवल्लभमहाराजाधिराज
परमेश्वरभट्टारकस्सर्व्वानेव माज्ञापयति विदितमस्तु वोस्माभिस्सप्तविंशत्युत्तरष
ट्सु तेषु शकवर्षेष्वतीतेषु प्रवर्द्धमानविजयराज्यसंवत्सरे दशमे वर्त्तमाने
——— दुपेन्द्र विज्ञापनया महासप्तमि ॥ विदि ॥ विषये कुमार - - - रग्रामो
- - - हि कुढम्बनामग्रामवेदवेदांगपारगेभ्यो ग्रेष्ठब्राह्मणेभ्यो दत्तः
एतेषान्नामगोत्राण्युच्यन्ते · भारद्वाजसगोत्रदेवस्वामिकौशिकसगो

त्र कर्क स्वामि भारद्वाज स गोत्र यज्ञ स्वामि कौण्डिन्य स गोत्र - - म्म स्वामि मौद्गल्य
स गोत्र देव स्वामि आत्रेय स गोत्र गर्ग स्वामि काश्यप स गोत्र रुद्र स्वामि वत्स स
गोत्र रास वर्म्मणां दत्तः - - आगामिभिरस्मद्वंश्यैरन्यैश्च राजभिरायुरैश्वर्य्यादीनां
विलसितमचिरांशुचञ्चलमवगच्छद्भिराचन्द्रार्कवरार्णवस्थितिसमकालं
यशश्चिरिषुभिस्वपुत्रनिर्व्विशेषमुक्तंच भगवता वेदव्यासेन व्यासेन. बहुभि
र्व्वसुधा भुक्ता राजभिस्सगरादिभिः यस्य यस्य यदा भूमिस्तस्य तस्य
तदा फलं. स्वदत्तां सुमहच्छक्यं दुखमन्यस्य पालनं. दानं वा पालनं वेति दाना
च्छ्रेयोनुपालनं. स्वदत्तां परदत्तां वा यो हरेत वसुन्धरां. षष्टिवर्षसहस्राणि
विष्ठायां जायते कृमिः महासान्धिविग्रहिक निरद्य पुण्य वल्लभेन लिखितमि
दं शासनमिति.



ದೈವಿಕ ಪ್ರಾಣಿಯಾದ ಕೈಗೂಗಾ ಪ್ರತಿಕೃತಿಯ ಸಮಾಧಿಗಳು
ಸಂಸ್ಕೃತಿಯ ಗಾಢ ಬಾಸ್ಕರಿಕೆ ಸ್ಮಾರಕಗಳು

ಸ್ಮಶಾನಗಳು ಬಹುಶಃ ಕಗ್ಗತ್ತಲೆಯ ಬೆಟ್ಟದ ಮೇಲೆ
ಸ್ಥಾಪಿತವಾದ ಪ್ರಾಚೀನ ಕೈಗೂಗಾ ಪ್ರತಿಕೃತಿಯ ಛಾಯಾಚಿತ್ರಗಳು
ಮೃತ ಪ್ರಾಣಿಗಳ ಅಂತ್ಯಕ್ರಿಯೆಗಳ ಸಮಾರಂಭದ
ಸಮಯದಲ್ಲಿ ಪ್ರಾಚೀನ ಕೈಗೂಗಾ ಸಂಕಲ್ಪಗಳು

[illegible]

[illegible]

[illegible]

[illegible]

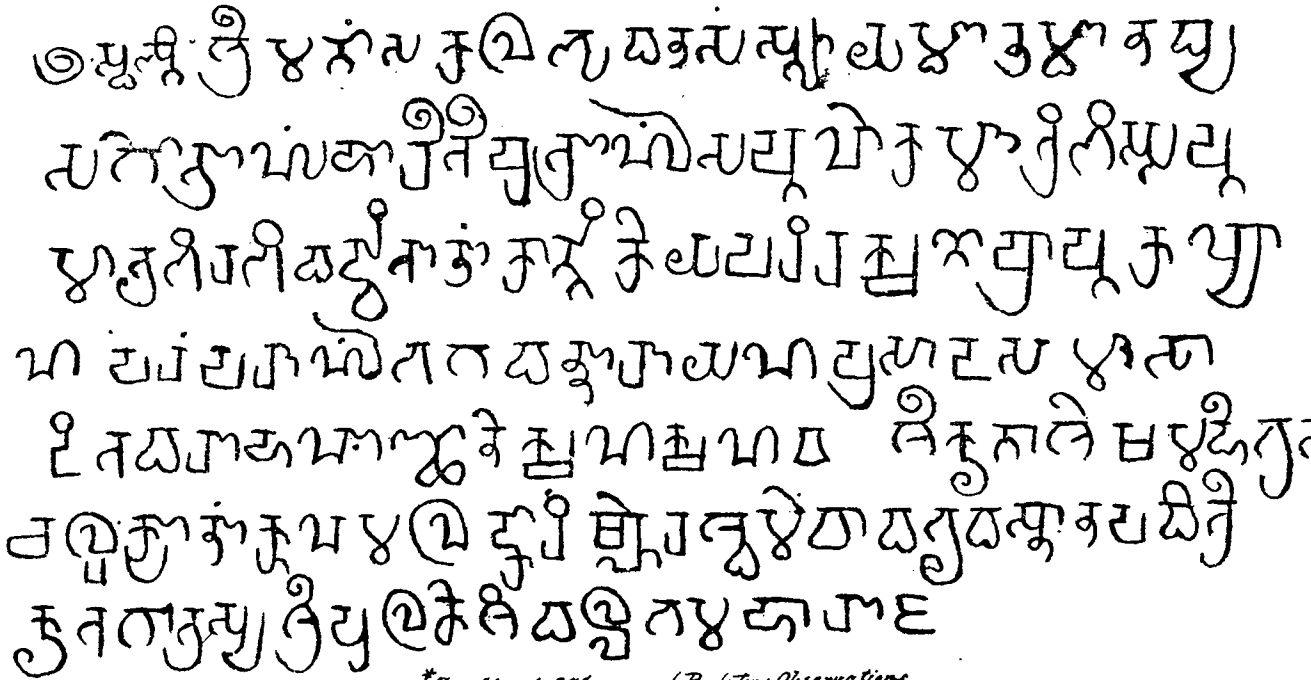
[illegible]

[illegible]

Transcript of No. III. in Modern Nágri

स्वस्ति . श्रीमतां स्वामिमहासेन पादानुध्यातानां . मानव्यसगो
त्राणां . हारिति पुत्राणां च लिक्यानां . वंशे संभूतः मानव पु
राण रामायण भारतेतिहास कुशलः नीतौ बृहस्पति समः
अग्निष्टोम वाजपेय पौण्डरीक बहु सुवर्णाश्वमेधावभृथ
स्नान पवित्री कृत शरीरः स्वगुणैर्लोक वल्लभो वल्लभः तस्य पु
त्रः परम ब्रह्मण्यः परराष्ट्रावमर्द्दी स्वराष्ट्रे न्यायानुवर्त्ती देवद्विज
गुरुपूजानिरतः सकल महीमण्डल व्यापि विमल यशः
स्वभुजबलपराक्रमोपार्ज्जितान्यराजवित्तः वृषभगमननयन निना
दः समदवरवारण विलासः सिंहविक्रमः नयविनयदानदया
दाक्षिण्य सत्य संपदोपेतः शक्तित्रयसंपन्नः परम भागवतः
मङ्गलराजः बभौ सत्वेन्य प्रतिमान किर्त्तिस्तम ॐ प्रमृन्दन्स्व
गुणांशुजालैः तेन राज्ञा शंकरगण पुत्रं गजतुरगपदाति
कोशबल संपन्नं बुद्धराजं विद्राव्य चालिक्य वंश संभवं अष्टा
दश समर विजयिनं स्वामिराजं च हत्वा संवत्सर पूज्यन मायां
कार्त्तिक द्वादश्यां कृतोपवासेनार्च्चित विष्णुनां काश्यप गोत्रस्य वेद
वेदाङ्ग विदुषः सुमति स्वामिनः पुत्राय वेद वेदाङ्ग पारगाय
प्रियस्वामिने कुलशील वृत्त संपन्नाय कोंकण विषये निःश्रे
यस समुदक पूर्व्वं कुण्डिवादक ग्रामो दत्तः उक्तं च तेन राज्ञा
यो स्य कुलाभ्यन्तरो न्यो वा रागद्वेष लोभ मोहाभिभूतो हिंस्यात्
स पञ्च महापातकोपपातकैस्संयुक्तः स्यात् धर्मशास्त्रेष्वप्युक्तं
बहुभिर्व्वसुधा भुक्ता राजभिस्सगरादिभिः यस्य यस्य यदा
भूमिः तस्य तस्य तदा फलम् स्वदत्तां परदत्तां वा यो हरेत वसु
न्धराम् षष्टिवर्ष सहस्राणि विष्ठायां जायते कृमिः षष्टि
वर्ष सहस्राणि स्वर्गे तिष्ठति भूमिदः आच्छेत्ता चानुमन्ता
च तान्येव नरके वसेत् ॥ स्वदत्तां सुमहच्छक्यं दुःख
मन्यस्य पालनं दानं वा पालनं वेति दानाच्छ्रेयोनुपालनमिति -

*No. VIII. The Kochré Inscription.**



**See Note to 2nd para: of Prefatory Observations.*

ಕಾಲ್ಪನಿಕ ಸ್ಥಿತಿಯಲ್ಲಿ ಸಂಕೇತ ಚಿಹ್ನೆಗಳನ್ನು ಬಳಸುವುದು
ಪ್ರಾಥಮಿಕ ಶಾಲೆಯ ಮಕ್ಕಳಿಗೆ ಸಂಖ್ಯೆಗಳ ಪರಿಚಯ ಮಾಡಿಸುವ
ಸಂದರ್ಭದಲ್ಲಿ ಸಂಖ್ಯೆಗಳ ಸಂಕೇತ ಚಿಹ್ನೆಗಳನ್ನು ಬಳಸುವ
ಸಂದರ್ಭದಲ್ಲಿ ಸಂಖ್ಯೆಗಳ ಸಂಕೇತ ಚಿಹ್ನೆಗಳನ್ನು ಬಳಸುವ
ಸಂದರ್ಭದಲ್ಲಿ ಸಂಖ್ಯೆಗಳ ಸಂಕೇತ ಚಿಹ್ನೆಗಳನ್ನು ಬಳಸುವ

Transcript in Modern Sanscrit of the Kochrè Inscription No VIII.

७ स्वस्तिश्रीमतां सकल भुवन संस्तूयमान मानव्य
स गोत्राणां हारीती पुत्राणां सप्त लोक मात्रिभि स्सप्त
मातृभिरभि वर्द्धितानां कार्त्तिकेय परिरक्षण प्राप्त कल्या
ण परंपराणां भगवन्नारायण प्रसाद समासा
दित वराह लाञ्छने क्षण क्षण वशी कृताशेष महीभृतां
चलुक्यानां कुलमलङ्करिष्णोरश्वमेधावभृथस्नान पवित्री
कृत गात्रस्य श्रीपुलकेशिवल्लभ महाराज
स्य प्रपौत्रः पराक्रमाक्रांत वनवास्यादि पर नृपति मण्ड
ल प्रणि बद्धविशुद्ध कीर्त्ति श्री कीर्त्ति वर्म्म प्रिथिवि वल्लभ महा
राजस्य पौत्र स्समर संसक्त सकलोत्तरापथेश्वर श्रीहर्ष
वर्द्धन पराजयोपलब्ध परमेश्वरा परनामधे
यस्य सत्याश्रय श्री प्रिथिवी वल्लभ महाराजाधिराज
परमेश्वरस्य प्रिय तनय रणशिरसिरि पुनरेन्द्रान्दि

शि दिशि जित्वा स्ववङ्शजां लक्ष्मीं प्राप्य च परमेश्वरतया
निवारित विक्रमादित्यस्तस्य ज्येष्ठो भ्राता श्रीचन्द्रादित्य
प्रिथिवि वल्लभ महाराजाधिराजस्तस्य प्रयमहि
षी कलिकाल प्रतिपक्ष भूता श्री विजय महा दे
वी [illegible] सर्व्वानाज्ञापयति विदित स्तुवो वैशाख
शुक्ल द्वादश्यां सोपवासा [illegible] वत्सस्सगोत्राय केख
ना [illegible] गोल स्वामिने कोच्चुरकग्रामे व कुलक
च्छ क्षेत्र नाम खज्जनसहितं उदकपूर्व्वन्दत्तं [illegible]
[illegible] सेतुनानिवार्य्यते योस्मद्वंङ्शजोन्योवानुपाल
यति सपुण्य भाग्भवति यश्चापहर्त्ता सपञ्च महापा
त कसंयुक्तो भवति षष्टिवर्षसहस्राणि स्वर्ग्गे
मोदति भूमिद आच्छेत्ताचानुचानुमन्ताच तान्येवनरकेव
से । स्वदत्तां परदत्तां वा योहरेत वसुन्धरां षष्टिवर्ष
सहस्राणि विष्ठायां जायते क्रिमि [illegible]

Table explanatory of the several Plate Characters.

Plate No. 3	Plate No. 2	Plate No. 1	Modern Sanskrit	Corresponding English characters	Plate No. 3.	Plate No. 2.	Plate No. 1.	Modern Sanskrit	Corresponding English characters
			अ	a				ट	ṭa
			आ	a'				ठ	tha
			इ	i				ड	ḍa
			ई	i'				ढ	ḍha
			उ	u				ण	ṇa
			ऊ	u'				त	ta
			ऋ	ri				थ	tha
			ॠ	rri				द	da
			ऌ	li				ध	dha
			ॡ	lli				न	na
			ए	e				प	pa
			ऐ	ae				फ	pha
			ओ	o				ब	ba
			औ	ao				भ	bha
			अं	am				म	ma
			अः	ah				य	ya
			क	ka				र	ra
			ख	kha				ल	la
			ग	ga				व	wa
			घ	gha				श	sha
			ङ	ṅa				ष	ṣha
			च	cha				स	sa
			छ	chha				ह	ha
			ज	ja				क्ष	kṣha
			झ	jha				ज्ञ	jna
			ञ	ña					

Vowel-marks					
a	á	i	í	u	ú
e	ee	o	oo	an	ah

Dotted letters are doubtful.
Letters and vowel-marks agreeing with those given in Prinsep's Tables, are marked with an asterisk.

ART. V.—*Some account together with a Fac-simile Devanágarí transcript and translation of a Copper-plate Inscription in the Society's Museum.* By the REV. P. ANDERSON, M. A.

The reare in the Society's Museum two plates engraved in what has been called the Gupta character and which is found on coins, stone slabs and copper-plates of the fifth and preceding centuries. Of one of these plates, which is called in these remarks No. 1, a fac-simile is given in a communication to the Bengal Asiatic Society's Journal for September 1835 made by W. H. Wathen, Esq. Secretary to the Bombay Government. The fac-simile is complete with the somewhat remarkable exception of the date, which is now supplied (१२०) and to which I shall have occasion to refer again.

The second plate Mr. Wathen stated to be so impaired by time and damp that only a part was legible. It occurred to me however that as a part was in good preservation, the whole might be decyphered by comparing it wlth corresponding plates. Accordingly I discovered in the Bengal Asiatic Society's Journal for November 1838 a Devanágarí transcript of a grant, which has enabled me to obtain a sufficiently correct acquaintance with the contents of this plate. This —which is here called No. 2,—is important as containing a regular list of kings in succession to those of No. I.

Both these plates record grants made by monarchs of the Valabhi dynasty and it is highly satisfactory that these and other records have thrown so much light upon this interesting family that by a collation of such documents we can arrive at some idea of their history.

The race traced its origin to the great hero Ráma who had two sons named Lava and Kusa, from the former of whom was descended Kanak Sena who emigrated to Dvárika and whom the Ránás of Udipur claimed as their ancestor. This family adopted for many generations the martial termination "Sena" or else "Aditya" denoting their solar origin, the one or other of which titles is ordinarily

found on these copper-plates attached to the names of princes; Bhaṭṭaraka was also a family name and is engraved on the seals attached to the grants. Kanak Sena wrested dominion from a prince of the Pramara race and founded Bhaunagar in the second century of our era. Four generations afterwards Vijaya Sena founded Vijayapura, Vidarbha and more particularly the famous Valabhi situated ten miles to the north-west of Bhaunagar. The Jaina religion is said to have been established in this place, but the Solar Orb and its type, fire, were the chief objects of their adoration. It arrived at great prosperity and was the chief town of Suráshtra. In the midst of the city was a fountain sacred to the sun from which arose at the summons of its king S'iláditya the seven headed horse Saptás'wa which draws the car of Súrya, to bear him to battle.

At last "the beautiful kingdom of Valabhadra" (1) was invaded by a barbarian force from the north A. D. 524, and the city "of a hundred temples" was sacked. In vain did S'iláditya call for his seven headed steed, against which it was supposed no foe could prevail. A treacherous minister revealed to the enemy the secret of annulling this aid by polluting the sacred fountain of the sun with blood. The charm was broken. No celestial war-horse came and the helpless Valabhis awaited their doom. Gazni near the modern Cambay became the last refuge of the family, but that too was captured by the barbarians. All fell except the daughter of Pramara. "The house of S'iláditya was left desolate. In its defence his heroes fell; of his seed but the name remained."

Colonel Tod thought that these barbarian invaders were Scythic, and Mr. Wathen that they were Bactro-Indians of which race many coins have been found in Suráshtra. Mr. Elphinstone suggests that they were Persians under Naushírwán.

As was mentioned, the daughter of Pramara the queen Pushpavatí alone escaped from the destruction of Valabhipura. Returning from a pilgrimage which she had made with a view of procuring from the gods the blessing of offspring she heard of her lord's death. Excessive

(1) Thus it is styled in Plate No. 2.

grief brought on her confinement and she was delivered of the son which the goddess had granted to her prayers. Committing her child to a trusty guardian, she mounted the funeral pyre and joined her husband. The boy was named Goha and becoming celebrated for his daring feats was elected king by the Bhils amongst whom he resided. From him was descended Bappa the next hero of the line of Valabhi. By his followers the dynasty and Jaina religion were transferred to Mewár. (1)

The city of Valabhi appears to have been never restored. The Valabhi line of kings was succeeded by a branch of the great Cháu-kya family of whose grants so many copper-plates have been discovered. Their seat of sovereignty was Analwara Patan.

These plates seem to establish the fact that the Valabhis did not at first exercise an independent sovereignty, but acknowledged a Suzerain who is styled in No. I. " the great sovereign, the sole monarch of the entire world," and to whom Drona Sinha was indebted for his elevation to the throne. Succeeding sovereigns are styled Mahárájá in plate, No. 1, but not in plate No. 2 until the reign of Dhara Sena the third who is styled "king of kings."

I now give a list of kings as found in these plates premising that it differs in some respects from lists which have been previously published.

1. Generalissimo Bhat.t.arka succeeded by his son.
2. Dhara Sena I, succeeded by his younger brother.
3. Mahárájá Drona Sinha succeeded by his younger brother.
4. Mahárájá Dhruva Sena succeeded by his younger brother.
5. Mahárájá Dhara Pattah succeeded by his son.
6. Mahárájá Guha Sena succeeded by his son.
7. Mahárájá Dhara Sena II, suuceeeded by his son.
8. Mahárájá S'iláditya Dharmáditya succeeded by his younger brother.

(1) This account is drawn from Tod's annals of Rájisthán Vol. I. chap. 2. from the Royal As. Soc. Journal Vol. XII. part 1, from the Bengal As. Soc. Journal Vols. IV and VII, and from Elphinstone's History of India Book IV. Chap. 1.

9. Mahárájá Is'vara Graha suceeeded by his son.
10. Mahárájá Dhara Sena III, succeeded by his younger brother.
11. Mahárájá Dhruva Sena Váláditya succeeded by his son.
12. Mahárájá Dhara Sena IV, succeeded by his great uncle.
13. Mahárájá Dhruva Sena Dharmáditya son of S'iláditya, and younger brother of Is'vara Graha.

In the Bengal Society's list the seventh, tenth, and twelfth of these kings are called S'rídhara Sena, but in both the plates now before me the names are precisely the same as the second, i. e. Dhara Sena with the addition of S'rí which is common to all the kings. Moreover S'iláditya is said in the Bengal Journal to be surnamed Kramáditya, but however glad we should be to recognize that well known name—the same as Vikramáditya—we must admit that the surname is clearly written on Plate II, Dharmáditya. Three of the other kings are not named Dharuva, but Dhruva Sena.

And now with regard to the dates—we have three of them to serve for our guidance. The first grant was made by Dhara Sena II son of Guha Sena, and was signed by his minister Skanda Bhaṭṭa. The two others were made by Dhruva Sena Dharmáditya, and signed by his minister Madana Hala, son of the above-mentioned Skanda Bhaṭṭa. From a reference to the list it will be seen that Dhruva Sena the last donor was grandson of Dhara Sena II, the first donor, and, as the minister of the former was father of the minister of the latter, we should not expect to find that any long interval had elapsed between the periods of the two grants.

The date of the first is thus [illegible], and not [illegible] as stated in the Bengal Journal, for April and November 1838. Supposing that the first symbol expresses 300, and the second 30, (1) we have the date 330. The second grant is said to bear the date 365, but no fac-simile of the symbol is given (2). The third grant (Plate II) bears the date [illegible] or 370, and some odd units, for the last symbol does not correspond with any produced by Mr. Prinsep. A comparison of their snpposed

(1) See a paper by E. Thomas, Esq., in the R. A. S. J. vol. XII. part I, p. 35.
(2) Bengal A. S. J. vol. VII. p. 978.

dates with the history of the grants makes the conjectures regarding the value of the symbols extremely plausible. The second grant mentioned in the Bengal Journal, is dated in the month Vais'ákha, and at least fifteen years earlier than the plate in this Society's museum which is dated in the month Pausha—both grants being made by the same king with the same minister.

At the same time there is some doubt whether ⅄ represents either 3 or 300. It is a suspicious circumstance that not only in all these plates, but in a series of coins of the Suráshtran princes, this symbol occupies the first place in the date, and we can scarcely suppose that all these kings, both of the plates and of the coins, lived in the same century (1).

There is however, a passage in a Chinese account of India, which, when compared with the supposed dates of these plates, affords a very remarkable coincidence. We are there told that, "Under the Tang-dynasty, in the years Wooteh (A. D. 618 to 627) there were great troubles in India; the king (S'íláditya?) fought great battles. The Chinese Buddhist priest, Huen Chwang who writes his travels, arrived in India at this period, and had audience of S'íláditya." (2) Now if the received supposition regarding the symbols of these plates be correct, S'íláditya reigned more than 300 years after the Valabhi era, that is, sometime after A. D. 619, which agrees remarkably well with the Chinese account.

We cannot fail to be struck with the points of similitude between these grants, and the Suráshtran coins. The figure of the bull Nandi is found in both, so is the title Kramáditya, and the common terminative Aditya; so is that of S'rí and Rájádhirájá, and Paramabhagavata, all tending to confirm the supposition before hazarded that the Valabhi kings in their local government succeeded the Gupta monarchs.

A fac-símile, a Devanágarí Transcript, and a translation of the first leaf of plate No. 2, are here given. The second leaf is so worn as to be illegible. Towards the end of this first leaf there are traces of at-

(1) R. A. S. J. vol. XII. Part I. p. 35. note.
(2) Quotation by Colonel Sykes in R. A. S. J. for May 1841.

tempts at restoration, and in many cases, altogether wrong letters appear to have been substituted. It became necessary therefore in making a translation to supply some sentences from the Bengal plate.

The two halves are joined together with a copper ring which has the usual seal of the Valabhis—a bull, and underneath it the name Bhaṭṭarka.

Some of the letters in plate No. 2, are different from those given by Prinsep, but as this might possibly have arisen from carelessness or ignorant attempts at restoration, they need not be specified, with the exception of the symbol (which more frequently expresses the letter *l* than the ordinary symbol ᳵ. For the Devanágári ए the symbol ᳶ is used, and also the more ancient form ⊥ which is scarcely to be distinguished from the symbol which denotes य. In plate No. I. ᳵ is also used for the same letter.

Devanágári Transcript.

स्वस्तिविजयस्कन्धावारे वासक प्रसभप्रणतामित्रानामै-
त्रकानामतुलबलसपत्नमंडलाभोगसंसक्तप्रहार शतलब्धप्रतापःप्रतापःप्रता
पोपन ॥१॥ तदानमानार्ज्जवोपार्जितानुरागानुरक्तमौलभृतः श्रेणिबलावा
वाप्तराज्यश्रियः परममाहेश्वर श्रीभटर्क्कादव्यच्छिन्नराजवंशमातापितृच-
रणारविंदप्र ॥२॥ णतिप्रविधौताशेषकल्मषः शैशवात्प्रभृतिखड्गद्वितीय
वाहुरे वसमदपरगजघटास्फोटनप्रकाशितसत्वनिकषःतत्प्रभावप्रणतारा-
तिचूडारत्नप्रभासं ॥३॥ सक्तपादनखरश्मिसंहतिः सकलस्मृतिप्रणीतमा-
र्ग्गसम्यक्परिपालनप्रजाहृदयरंजनान्वर्थराजशब्दोरूपकान्तिस्थैर्य्यगांभी
र्य्यबुद्धिसंपद्भिःस्मरशशांकाद्रिराजो दधित्रिदशगुरुधनेशा ॥४॥ नतिश
यानःशरणागताभयप्रदानपरतयातृणवदपास्ताशेषस्वकार्यफलप्रार्थनाधि-

कार्थप्रदानानंदितविद्वत्सुहृत्प्रणयिहृदय : पादचारीवसकलभुवनमण्डला-
भोगप्र ॥५॥ मोदःपरममाहेश्वरःश्रीगुहसेनस्तस्यसुतस्तत्पादनखमयूखसं
ततविसृतजान्हवीजलौघप्रक्षालिताशेषकल्मषः प्रणयिशतसहस्रोपर्जीव्य-
मानसंपद्रूपलोभादिवाश्रित ॥६॥ सरभसमाभिगामिकैर्गुणैःसहजशक्ति
शिक्षाविशेषविस्मापिताखिलधनुर्धरः प्रथमनरपतिसंमतिसृष्टानामनुपाल
यिताधर्म्मदायानामपाकर्तापजोपघातकारिणामुपप्लवा ॥७॥ नांदर्शयि-
ताश्रीसरस्वत्योरेकाधिवासस्यसंहतारतिपक्षलक्ष्मीपरिभोगदक्षविक्रमोविक्र
मोपसंप्राप्तविमलपार्थिवश्रीःपरममाहेश्वरःश्रीधरसेनस्तस्यसुतस्तत्पा॥ ८ ॥
दानुध्यातः सकलजगदानंदनात्यद्भुतगुणसमुदयप्रथितसमग्रदिङ्मंडलः
समरशतविजयशोभसंनद्धमंडलाग्रद्युतिभासुरतरयोधिजनगु ॥९॥ रुमनो
रथमहाभारः सर्वविद्यापरापरविभागाधिगमविमलमतिरपिसर्वतः सुभावित
लक्षणोपिसुखोपपादनीयपरितोषःसमग्रलोकभोगगाम्भीर्य्यहृदयोपि॥१०
सुचरितातिशयसुव्यक्तपरमकल्याणस्वभावशालीभूतकृतयुगनृपतिपथवि-
शोधनाधिगतोदग्रकीर्तिः धर्मानुपरोधोज्वलतरीकृतार्थसुखसंपदुपसेवानि
रूढःधर्मा ॥११॥ दित्यद्वितीयनामापरममाहेश्वरः श्रीशीलादित्यस्तस्यानु-
जस्तत्पादानुध्यातःस्वयमुपेंद्रगुरूणेवगुरूणात्यादरवतासमभिलषणीयामधि
राजलक्ष्मींस्कंधासक्तपरम ॥१२॥ भद्रइवधुर्य्यस्तदाज्ञासंपादनेनपरतयैवो
द्वहतखेदसुखरतिसुमनायितसत्वसंपत्तिःप्रभावसंपद्वशीकृतनृपतिशताशिरो
रत्नच्छायोपगूढ ॥१३॥ पादपीठेपिपरावज्ञाभिमानरसानालिंगितमनोवृ-
त्तिःप्रणतिमेकांपरित्यज्यप्रख्यातपौरुषाभिमानैरप्यरातिभिरनासादितप्रति
क्रियोपायःकृतनिखिल ॥१४॥ भुवनमोदविमलगुणसंहतिप्रसभविघटित
सकलकलिविलसितगतिःनीचजनाधिरोहिभिरशेषैर्दोषैरनामृष्टात्युन्नतहृ-
दयःप्रख्यातपौरु ॥१५॥ षास्त्रकौशलातिशयगणातिथिविपक्षक्षितिपति-
लक्ष्मीस्वयंग्राहप्रकाशितप्रवीरपुरुषः प्रथमसंख्याविगमः परममाहेश्वरः

श्रीश्वरग्रहस्तस्यतनय ॥१६॥ स्तत्पादानुध्यातःसकलविद्याधिगमविजित-
निखिलविद्वज्जनमनःपरितोषातिशयसत्वसंपदात्यागौदार्य्येणचविधृतानु-
सन्धानसमाहृतारातिपक्ष ॥१७॥ मनोरथक्षोभज्ञः सम्यगुपलक्षितानेकशा
स्त्रकलालोकचरितगम्भीरभावोपिपरमनम्रप्रकृतिरकृत्रिमप्रश्रयविनयशो-
भाविभूषणःसमरश ॥१८॥ तजयपंडितकोदंडप्रबलोदग्रशरदंडविध्वंसि
तनिखिलप्रतिपक्षदर्पोदयःस्वधनुः प्रभावपरिभूतास्त्रकौशलाभिमानसकल
नृपतिमण्डलाभिनन्दि ॥१९॥ तशासनःपरममाहेश्वरःश्रीधरसेनस्तस्यानु
जस्तत्पादानुध्यातः सच्चरितातिशयितसकलपूर्वनरपतिरतिदुःसाधनाम
पिप्रसाधयिताविष ॥२०॥ याणांमूर्त्तिमानिवपूरूषकारःपरिवृद्धाङ्गगुणा
नुरागनिर्भरचित्तवृत्तिभिर्मनुरिवस्वयमभ्युपपन्नः प्रकृतिभिरधिगतरंगाक-
लापक्षांतिमान्निवृत्तिहेतुरकलङ्ककुमुदना ॥२१॥ थप्रभः प्रतापस्थगित
दिगन्तरालप्रध्वंसितध्वांतराशिःसततोदितःसवितापकृतिभ्यः परप्रत्ययमर्थ
मतिबहुविधप्रयोजनानुबन्धमागमपरिपूर्णं ॥२२॥ दधानः सन्धिविग्रहस
मासनिश्चयनिपुणःस्थानानुरूपमादेशकृत्गुणभृद्भिः विधानजनितसंस्का-
रःसगुणराज्यशालागरीयस्तन्त्रयोरुभयोरपि ॥२३॥ निष्णातः प्रकृष्टवि-
क्रमोपिकरुणामृदुहृदयः श्रुतवानप्यधर्म्मविश्रान्तोपिप्रणतिस्थिरसौहृदयो
पिनिरसितरिपुवर्गाणामुदयसमयसमु ॥२४॥ पजनितजनतामुरागपरि
पिहितभुवनसमर्थितःप्रथितबालादित्यद्वितीयनामापरममाहेश्वरःश्रीध्रुवसेनः
तस्यसुतस्तत्पादकमल ॥२५॥ प्रणामधरणिकषणजनिताकिणलाञ्छन
ललाटचन्द्रशकलः शशिभावल्गुश्रवणनिहितमौक्तिकमालांशुरभ्रमामल-
श्रुतविशेषप्रदानस ॥२६॥ लिलक्षालितविग्रहः

परम ॥२२॥ माहेश्वरः परमभट्टारकमहाराजाधिराजपरमेश्वरचक्र
वर्त्ती श्रीधरसेनः

Translation.

It is well. He who dwells in the glorious metropolis, whose dignity was gained by a hundred conflicts which resulted in misery to a crowd of enemies, and by the unrivalled strength of friends who had been foes prostrated before his might; who was born of a pedigree which conciliated the affections it had gained by royal uprightness, respect and munificence, whose sin was thoroughly washed away by bowing to the lotus feet of his parents who were of a royal race in an unbroken succession from the glorious *Bhaṭṭarka* a worshipper of Mahá Is'vara, and prosperous in the kingdom which he had obtained by the force of numbers; who tore the furious elephant-like hosts of his foes with his second arm which from childhood was like a sword; a touchstone of manifested truth; the brilliancy of whose toe nails was from the rays of the jewels of enemies crests bowed to his power; who observed altogether the course of duty prescribed in the whole law; for whom the word "king" had its meaning for he gained the hearts of his people; who surpassed Kuvera, Ganapati, the ocean, the lord of hills, the moon and love, in wealth, wisdom, depth, firmness, lustre and beauty; the fruit of whose actions was cast away like grass in bestowing the gifts of security upon those who came to him for protection; whose heart was drawn towards learned friends who were made happy by the bestowal of more wealth than they desired; who received enjoyment from the whole world as one travelling through it; the worshipper of Mahá Is'vara, the glorious GUHA SENA.

His son, all whose sin was washed away by the rays of his father's toe nails as by a stream of Ganga water diffused abroad; who was the residence of desire, beauty and wealth which supported a hundred thousand friends; who as an archer astonished all by the special skill of his innate power, and qualities which were quickly gained; the preserver of gifts made by the wisdom of former kings; the remover of portents which caused difficulties to his subjects; a manifestation of Sarasvatí, and Lakshmí who dwelt together in him; whose power was capable of gaining possession of the wealth of hosts of enemies;

who had pure, and regal power obtained by his power; the great worshipper of Mahá Is'vara, the glorious DHARA SENA.

His son, who meditating on his father's feet was celebrated in all the four regions for the number of qualities which astonished and delighted the whole world; who had great influence over the desires of the best of warriors who were made more illustrious by the splendour of his sword, arrayed, as it were, with the ornaments of the victories of a hundred fights; possessing an intellect which had studied the good and bad parts of all science; who was distinguished for his excellent speech; who found a delight in communicating pleasure; whose heart was a depth of enjoyment for all people; who was endowed with a most happy disposition; whose vast reputation was obtained by purifying the ways of the kings born in the golden age, unrestrained by slavery to his prosperity, pleasure, and wealth, which were the more illustratrious as they were no impediments to duty; the great worshipper of Mahá Is'vara, the glorious S'ÍLA'DITYA surnamed DHARMA'DITYA.

His younger brother meditated on his feet; he was fit to bear, as if fortune were seated on his shoulder, the prosperity of a supreme sovereign which was equal to Indra's. His footstool was concealed by the lustre of the jewels from a hundred heads of kings who had been subjected to the prowess of his power; his mind was not embraced by the sentiments of pride and contempt; revenge was unattempted even by those of his enemies who despised celebrated men, and ceased to shew him courtesy; the forgotten course of the iron age was inverted by the force of his pure qualities which rejoiced the whole world; his large heart was unscathed by those vices which exist in vile persons; his heroism was manifested, and it took to itself the prosperity of hostile kings who became his guests in consequence of his large armies, the success of his arms, and his great reputation; he ever occupied the first place, the worshipper of Mahá Is'vara, the glorious IS'VARA GRAHA.

His son meditated upon his father's feet; all learned men were surpassed by his study of all the sciences; he knew the emotions by which the hosts of his collected foes were agitated after their investi-

gations into his magnaminity, abstraction from the world, wealth, excessive goodness, and happiness; he had a very humble disposition, and at the same time profound experience in men, arts, and various works which he thoroughly understood; he was delightfully adorned with the modesty of unartificial courtesy; the rising of the pride of all his opponents was destroyed by the chastisement of his arrows propelled by the force of a bow which had learned victory in a hundred fights; his edicts were delighted in by a multitude of kings, the pride of whose success in arms was dispersed by the power of his bow, the worshipper of Mahá Is'vara, the glorious DHARA SENA.

His younger brother meditated upon his feet; all former kings were eclipsed by his good conduct; an accomplisher of the most difficult affairs he was, as it were, manly energy become incarnate; like Manu, he was self-endowed with strong feelings, love of virtue, and a full-grown stature; bright as the lord of the lilies when he is without spot; a sun which is ever risen, by which the mass of darkness is destroyed when the sky is covered with its brilliancy; completely and accurately skilled in peace and war; accomplishing that which is produced by religious rites; of pre-eminent heroism and yet with a merciful and gentle heart; attending to the scriptures, and ceasing from sin; firm in his attachment to such as submitted, but prompt to repress his enemies before their prosperity gained head; the celebrated worshipper of Mahá Is'vara, the glorious DHRUVA SENA, surnamed VA'LA'DITYA.

His son had on a part of the moon of his forehead a callous spot caused by rubbing the ground in bowing to his lotus feet; the effulgence of a string of pearls was attached to his ears, which were beautiful as moon-light; his body was washed with the water of liberality according to the clear and pure scriptures.....
.....The worshipper of Mahá Is'vara, the sage, the king of kings, the mighty lord, the emperor, the glorious DHARA SENA.

ART. VI.—*A Geographical Description of certain parts of the Southeast Coast of Arabia to which is appended a short Essay on the Comparative Geography of the whole of this Coast.* By H. J. CARTER, Esq., M. S., formerly Surgeon of the H. C. Surveying Brig. "Palinurus."

Two excellent "Memoirs" of the Southeast Coast of Arabia, by Captain Haines I. N. now Political Agent at Aden, have already been published in the IXth and XVth Volumes of the Journal of the Royal Geographical Society, but these relate more particularly to the parts which Captain Haines surveyed. Since that the remaining parts of this coast have been surveyed by Captain Sanders and Lieutenant Grieve I. N., respectively, and a similar memoir of them is required to complete the Geographical Description of the rest of this Coast.

It is to supply this desideratum that I have arranged in a descriptive form the few notes I made during the latter surveys, and as Captain Haines' "Memoirs" relate more particularly to the parts he surveyed, so my description will relate more particularly to the parts surveyed by Captain Sanders and Lieutenant Grieve. I could have wished that it had been accompanied by more nautical information, but I left others who were better fitted from their profession to collect this than myself, and I must still leave this for them to supply. The latitudes, longitudes, soundings and outline of the coast will of course be found in the beautiful charts which have been constructed from these several surveys.

Being now tolerably well acquainted with this coast throughout both personally and through what has been written of it in modern days, I have attempted also to compare it with the little that remains to us of its description by the Ancient Geographers, and this short essay I have appended.

Previous, however, to understanding the latter, or taking much interest in the former, it will be necessary to possess the charts of this

coast which have been published by the East India Company and to read at least Captain Haines' two "Memoirs." The charts of the latter surveys are not yet published, but are I believe in the hands of the engraver and will appear soon.

With this short introduction I proceed to my subject, and as we left Maskat each year to enter upon the surveys of Captain Sanders and Lieutenant Grieve, will commence my description from that place, briefly noticing the features of the coast on to Ras el Had.

On sailing southward from Maskat we observe the land at first, broken up and thrown into all positions resembling the waves of a troubled sea; rising tier behind tier until it reaches its maximum height at a mountainous ridge called Jibel Fallah [1], forty or more miles inland. This ridge which is about 6,000 feet above the level of the sea [2], as we continue our course southward, gradually approaches the coast, and terminates on the sea-plain in the northern boundary of a remarkable opening called the "Devil's Gap"; it is here called Jibal Kariyat,[3] and is 6,228 feet high, [4]. Another ridge then commences forming the southern boundary, called Jibal Jābar which is continued on close to the sea to the town of Sur, where pursuing its original direction it leaves the coast-line again, while the latter trending eastward terminates in the low sandy plain of Ras el Had.

The "Devil's Gap" is the opening upon the coast of a great valley called Makalla Obăr [5]. It is remarkable for its narrowness and the great height of the ridges on each side, which being frequently joined together by a streak of dark clouds forms a fenestral opening through which an extended view of the picturesque valley within is seen to much advantage. The neighbourhood of this opening is well known for sudden gusts of wind, which frequently threaten destruction to the most sturdy crafts.

After this the land which I have stated to gradually rise from the shore, becomes precipitous and within eight miles of the sea attains a height of 4,400 feet [6]. At first it is called Jibel Jābar perhaps

1 Wellsted's map, Trav. in Arab. Vol. I. 2 Idem.
3 قريات 4 Chart by Lieut. Grieve. 5 مكلة ابر 6 Lieut. Grieve.

after the Beni Jābar [1] who inhabit it; and then Kalhat [2] until it arrives at its termination close to the town of Sur; after this the coast turns to the eastward, and not rising more than 200 feet above the sea, terminates decreasing in height in the low sandy plain of Ras el Had.

Between the "Devil's Gap" and Sur, there are "no soundings more than half a mile off shore" [3], and here I may mention once for all that on this as well as on the southeastern coast, wherever the land is high close to the sea the soundings are deepest, and the rapidity with which the land shelves off and the depth of the sea are in proportion to the height of the adjoining cliffs, while the contrary is the case where the land is low and continues so for some distance inland. It may be taken as a rule that wherever the coast is low, there the sea is shallow, and wherever it is high it is deep. In lat. 22° 35′ N., and long. 59° 33′ E., is the town of Sur situated on the banks of a creek, and about ten miles further on towards Ras el Had are the entrances of two salt-water lagoons, the first of which is called Khor Jarāmah, and the second Khor Hajar.

Between the town of Sur and the entrance of the former, the sea cliff averages from fifty to seventy feet high.

Lieutenant Grieve, who surveyed this coast and to whom I am indebted for much valuable information respecting it, states :—"The entrance to Khor Jarāmah is from 200 to 250 yards wide, and bounded on each side by precipitous cliffs. The depth of the water from eight to ten feet, and the bottom muddy. After extending inland for about a mile and a half the channel becomes divided into two branches by a small rocky island, about the same height as the adjacent land, and then comes a spacious basin whose south and eastern shores are low, swampy, and overgrown with mangrove. On the S. E., the land is tabular to its termination, not only to Khor Hajar, but with the exception of a few hillocks to Jibal Saffan. A town once existed on the S. W. side of this lagoon, but is said to have been abandoned for want of water. A ruined town alone now marks its site. There are no in-

1 جابر 2 قلهت 3 Lieut. Grieve.

scriptions there. The anchorage is frequented by native vessels merely as a place of refuge during bad weather. It is in the territories of the shaykh of El Had" [1].

About a mile further on towards Ras el Had is the entrance to the other lagoon called Khor Hajar. This is very inferior to the former; it is much smaller and nearly all dry at low water. The entrance to it is through the extremity of the sea-cliff just before the latter sinks into the sandy plain of Ras el Had. The channel is ragged, about 100 feet wide, and its sides about twelve feet high. After a distance of little more than half a mile, it opens into a shallow basin about a mile and half wide, bounded on the western side by the tabular land mentioned by Lieutenant Grieve, and on the S. and E. by the sandy plain of Ras el Had. Like Khor Jarāmah, its longest diameter is east and west, and it runs eastward from its entrance.

At the eastern extremity of this khor are a number of ruins, and among them a large square building of modern construction, forsaken and also in ruins. There is also a little jetty or wharf at the eastern end of the khor which served as a landing place when, according to tradition, the khor was much deeper than it is at present. The ruins just mentioned do not appear to be the remains of buildings of any consequence, although they are said to be those of a very old town.

About 100 yards S.E. of them is the modern town of El Had [2], consisting of one square mud building in ruins, and two round towers, with a number of huts enclosed within slight fences of bullrushes.

The inhabitants of the place when we visited it, appeared to be all industriously employed in making and mending fishing nets, and the shaykh, by name Abdullah, was a young man of high cast of countenance, and of gentle and prepossessing manners. He treated us with much civility, and offered us every assistance in his power during the time we were at El Had. The Captain made him presents, and he supplied us with water. Two or three days were spent on shore here in measuring a base and obtaining the latitude of the cape.

1 Priv. M.S. 2 Gharkah, with Capt. Haines.

The people of El Had and its neighbourhood are called the Mualak.[1] I was struck with the absence of arms among them, hardly any but the shaykh wore even a jambea. They color their faces with turmerick and oil; this forms part of their morning ceremony or toilet after prayers, and they are desirous, of paying the same compliment to strangers.

Returning to the entrance Khor Hajar, and following the coast eastwards we almost immediately pass from the table-land between it and Khor Jarāmah on to the sandy plain of Ras el Had, and two or three miles farther brings us to the angle forming the cape itself called also Ras el Gat[2] or the lowland cape. The latter is marked by the tomb of a shaykh said to have been called "Farrah," it merely consists of a simple ridge of masonry surrounded by a heap of stones. About a mile inland from the cape lies the town of El Had.

From this cape may be seen two remarkable mountains called Jibal Saffan which I shall presently describe, bearing about six miles south; the mountainous group called Jibal Kims[3] about S.S.W.; and Jibal Jallan[4] about S. W. by W.; the latter are the continuations southward of Jibal Kalhat and are the southern termination of the great mountainous range on this side of Arabia.

The soundings opposite Ras el Had deepen rather suddenly as well as I can remember, and when we were there a strong current sat to the eastward. It is famous for large fish, we caught the largest cod there of any on the coast and all the other rock-fish taken were proportionably large, almost gigantic.

Proceeding southward from Ras el Had, for the coast now runs due south, the sea-cliff after a distance of three miles commences in the sandy plain with a few scattered rocks much as it ended on the western side, and soon reaching a height of 100 feet maintains this with the interruption of a short break or two here and there all the way to Ras el Khabba, a distance of twenty miles, where the coast, turns again, to the southwest.

1 الموالك 2 غايط ؟ 3 كمس 4 جعلان

In passing along this short extent of coast, which has an eastern aspect, we obtain a full view of the two mountains called Jibal Sifan, for they lie within a mile and a half of the shore. They are very remarkable, for they are the only mountains on this extremity of Arabia, and are eight or nine times higher than the rest of the land. Lieutenant Grieve makes them 855 feet above the level of the sea. They are extremely similar in their appearance and from their proximity to each other being but a mile and half a part, they merit the name of "Twins" more than any double mountain I ever saw. The northernmost is the most westward and therefore a notch is seen between them in sailing round this extremity of Arabia both north and south. They are coin-shaped and their scarped white surfaces present towards the west, while their more gradual inclinations tend eastwards or towards the sea; around them are a few low hills but beyond these there is nothing much above 100 feet. As a mark for Ras el Had or this extremity of Arabia they are unmistakeable.

From Ras el Khabba the coast as before said turns S. W., and soon becoming low and sandy continues so with the exception of a few hillocks at Ras el Rues, and a few rocks at Ras Jibsh, on to Ras Abo Ashrin, a distance of 100 miles. The chief character of this coast is its uniformly desolate sandy aspect. After the mountainous groups of Kims and Jallan nothing more is to be seen inland to the westward much above 100 feet and seldom even a mound so high as this on the coast.

The next cape to Ras el Kahbba proceeding southwestward is Ras Rues, consisting only of a few sandy hillocks, and between these two points, a distance of about three miles, is a little bay called the bay of Rues, while behind the cape, concealed from the sea, is a village of the same name inhabited by a few fishermen of the Beni Bu Ali[1] tribe. It was from thence that we obtained the pilots who conducted us through the channel between the island of Masira, (to which we shall soon come), and the mainland.

1 بوعلي

From Ras Rues the coast continues low to Ras Gomailah the next projecting point, and so on to Ras Jibsh. The town of Lashkarah, the principal one on this coast, lies about eight miles S.W. of Ras Gomailah.

After turning Ras el Khabba[1] the mountains of Jallan or Jibal Jallan become very conspicuous; they are about 3,900 feet high, and towering behind them is seen the mountainous ridge of Kalhat, while in front is a number of low sandhills and cones extending more or less on to Ras Jibsh. The latter are about five or ten miles inland. Jibal Jallan is about twenty miles from the shore.

In the map which accompanies the late Captain Wellsted's travels in Arabia, a "low ridge of lime-stone hills 200 feet high" is placed westward of Jibal Jallan; and beyond Ras Jibsh "sandy mounds topped with acacias." Messrs. Cole and Rankin who travelled from Jallan to Ras Jibsh, informed me when they arrived on board that they had passed over nothing but sand-hills and barren ground. Still farther westward of Ras Jibsh towards the Desert of Akaf, Captain Wellsted has placed "plains covered with a saline effervescence," so that all trace of mountains appears to be lost here on an increasing barrenness.

We now come to Ras Jibsh. This cape is about fifty-four miles from Ras el Khabba, and consists of a little ridge covered with white sand nearly to the top, where the dark rocks of which it is composed shew themselves in irregularly formed peaks and mounds. They are about 100 feet high. From their extremity a low reef extends outwards into the sea, and inside it is a small bay with water enough for fishing boats to land safely. This is called the bay of Jibsh. Formerly it is said to have extended a long distance inland behind the ridge mentioned where there still exists a lagoonal depression about two miles square, but now raised twelve feet above the level of the sea. The village of Jibsh is between this and the ridge, and consists of a few fishermen's huts built of the midribs of date-leaves. Jibsh is inhabited by the Janabah,[2] a cognate tribe of the Beni Bo Ali; they affirm that formerly Bagalos came into their harbour when the lagoonal depression mentioned, was covered with water.

1 Lieut. Grieve. 2 جنبه

From our station twelve miles S.W. of Ras Jibsh, we could see the highest points of Jibal Jallan and Jibal Kalhat but [illegible] other high land, even from the mast-head, in any other direction. Jibal Jallan must have been fifty milles off, and Jibal Kalhat at least seventy or eighty. The country over which we looked is called the Baten, or flat land ; it must I think pass into the Desert of Akaf.

From Ras Jibsh to Ras Abu Ashrin, the aspect of the coast is more desolate than ever. Not a cone or elevation either inland or on the sea disturbs the uniformity of a continued wavy land about 100 feet high which appears to exist throughout; saving a little group of black huts on the shore called Nayah, there is not a particle which seems to differ from the general light brown color of the coast all the way to the neighbourhood of Ras Abu Ashrin.

About six miles however before arriving at this cape, there is a remarkable change. At intervals there is a sea-cliff varying in height to 100 feet, while in shore there are nothing but domes of white sand about 200 feet high like snow, smooth and frequently so hard on the surface that a man can walk over them without sinking. There is a place here also called Shebalah inhabited by the tribe of El Whebah, of whom I shall speak directly.

The tribes who possess the coast from Ras Rues to Ras Abu Ashrin, are the Beni Bu Ali, the Janabah and El Whebah.[1] I have already stated that the Mualak occupy El Had and its neighbourhood. The territory of the Beni Bu Ali extend sfrom Ras Rues to Ras Jibsh, but they are much mixed up with their cognate tribe the Janabah. Towards Ras Jibsh the inhabitants are nearly all Janabah, and continue so on to the neighbourhood of Ras Abu Ashrin where they join the Whebah.

Inland to the west of Jibal Jallan, are the Beni Bu Hasan,[2] the Beni Rashib,[3] the Hashem,[4] Mashakarah[5] and Ammar[6] and towards el Had, the Hajariten,[7] Hareth,[8] Habosh[9] &c. About Sur are the

1 وهيبة 2 بوحسن 3 راشب 4 الهشم 5 مشاكرة 6 عمر 7 حجرتين
8 حرث 9 حبوش

Janabah,[1] Hoājar and Sinan,[2] and on Jibal Kalhat as already stated the Beni Jabar.

We received more attention from the Beni Bu Ali than from any other tribe, during the survey of this part of Arabia. They are religious, warlike and hospitable. The old Amir, who is the only remaining chief of those who were taken prisoners to Bombay in 1821, after the tribe had been nearly annihilated by the force under Sir Lionel Smith, was the only person in this part of Arabia who dared give us a pilot, to conduct us through the Straits between the island of Masira and the mainland. Although at the time I am speaking of very much afflicted with the infirmities of age, he would come on board to see the Captain, when the "Palinurus" was anchored off Ras Rues, and left with us two men, Hamed and Nassar, whose conduct afterwards in keeping good faith, and in the performance of their duties as pilots, was the admiration of all, and surpassed all praise that could be bestowed on them. Doubtless it was their religious regard for the old Amir that induced them to submit for so long a time and without murmur or dissatisfaction, to the many discomforts which their new mode of life on board an English ship with none but Europeans, must have entailed on them.

The providing of us with these pilots, however, had very nearly led to a breach between the Beni Bu Ali and Janabah, as the latter consider the Straits between Masira and the mainland peculiarly their own. They openly declared that they would go to war with the Beni Bu Ali the moment we left the shore, and although it is probable that they did not carry their threat into execution, still they cannot be otherwise than displeased with them for having allowed us to obtain through their assistance, a knowledge of a channel which offered to the Janabah a safe retreat in cases of piracy or other offences when pursued by an English vessel.

The admiration of the Beni Bu Ali for the English is unaccountable after the extent to which they were slaughtered by the force men-

1 هوا جر 2 سنان

tioned; their chief topic of praise is that their date-groves were not destroyed, or the tribe would have inevitably been annihilated.

The Beni Bu Ali are much more under the influence of their chief than any other tribe on this coast. Generally speaking on the southeast coast of Arabia, the Beduins acknowledge no authority in matter of dispute, though they admit priority of descent. The consequences of the "blood-feud" alone seem to restrain them from lifting their hands against each other, and this not often.

The Beni Bu Ali are Wahabis, and are strict in their religious observances. They do not smoke tobacco or wear the rosary, and are opposed to raising monuments over the dead. They hold the praying of their neighbouring tribes in great contempt, saying that they only throw their arms backward and forwards and touch the ground with their heads, but say no prayers. The Amir of the Beni Bu Ali enforces under threat of corporeal punishment, or even death, implicit obedience of his tribe to the catechism and laws of Abd el Whahab and his followers.

The countenances of those whom I saw, were peculiar. They were all middle sized men with shortish features, quick deep set, piercing eyes, and determined expression. They wear their hair long and flowing over the shoulders, but confined round the head by a leather cord. Their dress consists of the common Arab-shirt, and around their waist a broad leathern girdle buckled in front. Attached to this girdle are horns of the female gazelle, indeed the whole girdle is nearly made up of them, arranged perpendicularly side by side, and each contains a charge for a match-lock. In addition to this, the girdle has a pouch for spare bullets, and one for flints and tinder; a steel also in the form of a compressed ring is suspended to it by a long string; while round their neck is a leathern loop to which is attached a powder flask which hangs down between their shoulders, and is made out of a goat's horn ornamented with silver.

Having mentioned the principal tribes which inhabit this angle of Arabia, I will now briefly state the information obtained respecting the towns and villages of those who live on the coast.

The village of Rues I have mentioned. Next to this comes Laskhara, the largest by far on this coast. I have before stated that it is about eight miles S.W. of Gomailah; it contains about 200 houses and about 1,000 inhabitants, most of whom are members of the Beni Bu Ali tribe. They have several boats.

The next place worth mentioning is the village of Jibsh, which as before stated, is inhabited by Janabah, and consists of a few huts scattered over the sand behind the ridge of the cape. These are about a mile inland and situated on an exposed cheerless waste. They are built of the midribs of date-leaves both walls and roof, and are about six feet square; sparingly furnished, for they contain nothing more than an earthen jar or two for cooking and for holding water; the soft sand which forms the floor serving for both bed and bedsted. The fuel of the Janabah here which consists of the dried herbaceous shrubs of the desert, is kept from blowing away, by a large meshed net fastened over it to the little hut, so bleak and exposed is the situation.

The inhabitants subsist almost entirely on fish with the addition of dates, and a little rice when they can obtain it. The dates are brought from the interior on camels in exchange for dried fish. They procure the rice by the sale of shark-fins and other dried fish at Maskat, or from the Nakodahs of vessels trading along the coast.

Miserable, however, as their condition appears to be they contrive to get wealth enough to ornament their wives with silver armlets, necklaces, &c., and within a few hours can manage to assemble a very fair display of sheep, as to number; all ewes which they keep for milk; only one or two rams are kept, the rest are devoured almost at their birth. The pasturage here consists of a sweet kind of grass which grows in tufts just above the sand; these tufts consist of the matted fibres of old roots, which extend deep into the ground and are sparingly scattered here and there.

The people of Jibsh were so much frightened on our approaching the shore that they had laden their camels with their ropes, sails, fishing nets, &c., and were on the eve of starting when one of our Beni Bu Ali pilots leaping into the water, swam to the shore and assured them that we were not going to harm them. Their women

and children, sheep, camels, and all that they had of any value, were prepared ready for flight.

I endeavoured to find out from them during the two days I passed on shore, if the country round was much inhabited, but could obtain no satisfactory answer. They did not know or evidently exaggerated the number of inhabitants from fear. A Beduin who had just arrived from the interior, answered my questions by taking up a handful of sand and carelessly dropping it, meaning me to infer, that they were as plenty as grains of sand; another said there were no people at all to the westward, and a third whose anwser was probably the most truthful of all, stated that he knew nothing at all about it.

The Janabah whom I saw here, were rather undersized, not bad looking though thin and ill fed. They were all very dark and wore their hair and were dressed, like the Beni Bu Ali. The fishermen of the coast, however, were of a lighter color than the rest; their heads were long and compressed; their foreheads high, but with the hairy scalp extending much over them. The nose particularly Jewish, and the septum nasi considerably beneath the nostrils or the latter elevated. They are all "wreckers," and consider every thing that stands on this coast the property of the tribe to whom the part of the coast belongs. It would be well for many perhaps if they kept to this, but the probability is that they are no more content with it alone than the Beduins on shore with what they can honestly obtain. If the truth were known, I expect the Janabah are the worst characters on this coast.

Next to Jibsh, with the exception of the few huts close to the sea called Nayah, also inhabited by Janabah, comes Shebala.[1] This place or group of huts, is situated among the white sand hills mentioned, close to Ras Abu Ashrin. It is inhabited by the Whebah. Their huts are constructed just like those at Jibsh, and of the same material. The Whebah tribe is said to extend from this cape up to Maskat, which means I suppose a long way inland in that direction.

1 شبله

When we approached their shore, in one of the ship's boats, the inhabitants who had been watching us like the people at Jibsh, were seen wading with their camels over the sand hills as fast as the nature of the ground would allow them, so that when we landed there was not a soul to be seen. At length two men made their appearance on the top of one of the hills, and slowly descending approached us with great caution, and seated themselves at a distance. Our Beni Bu Ali pilot then addressed them, and after a short conversation in which they were made to understand that our visit was a friendly one, they came and sat by us, and this being a signal for the rest who in all probability were peeping over the tops of the hills at a distance that there was no fear, the whole party soon returned and tranquillity was re-established. They then told us that they had fled under the idea that we were in league with the Beni Bu Ali and Janabah, and had landed to plunder them. Having come to a proper understanding, oaths were taken on both sides that person and property should be respected while we remained there, and the usual business of buying sheep and taking observations commenced, the former assisting greatly towards reconciliation.

The Whebah like the Beni Bu Hassan are said to be subdivisions of the great tribe of Hanāwi, while the Beni Bu Ali and the Janabah are descended from the Beni Ghrafir.[1] The territories of the former extend from Ras Abu Ashrin where they have a few miles of sea-coast, northwards towards Maskat, and their Shaykh, whose name in 1845 was Nassar Bin Ali, is said to reside at a place inland called Sidirah.

They informed us that the land towards the N. and N. W. was all sand-hills, and that half the way to Maskat it was the same; also that towards the W. and S.W. there were neither inhabitants nor water, all was sand.

It would appear that the Whebah inhabit the eastern borders of the desert of Akaf, and next to them eastward come the Beni Bu Hassan, and then the Beni Bu Ali and Janabah. The two former are allies of the Imaam of Maskat, the two latter his adversaries; the former are of the orthodox religion, the latter Wahabis. Hence there is great enmity

1 غافر

of feeling between the two parties and the poor Whebah on the little coast, they possess get much persecuted by both the Beni Bu Ali and Janabah. By the former perhaps more on account of their religious differences, by the latter from jealousy, arising from the advantage they haves in being able to fish on the coast, and perhaps keep up a kind of espionage there. As to religion, I hardly think the Janabah have any, at least if they might be judged in this respect by their outward observances; if they incline to any particular sect it is probably to the Wahabis from their intercourse and relationship with the Beni Bu Ali.

The huts of the Whebah and their means of subsistence are similar to those of the Janabah at Jibsh, but the people are much better looking and more gay and playful. The same was stated to me of the Beni bu Hussan by Mr. Cole who visited this tribe, while the Beni Bu Ali were gloomy and determined in their expression. Some of the Whebah girls were exceedingly pretty, and unlike the Beni Bu Ali, the women of this tribe do not conceal their faces, so far as we saw. Many of the young women were engaged in making rush basins commonly used by the Beduins for holding milk or water. In doing this they wear pendent from their left wrist a little basket in which are coiled the slender rushes ready for use, and thus with both hands free they continue to work either walking or sitting or while conversing, much after the way in which knitting is done among more civilized people.

The Whebah have but few boats, and being very poor are obliged to have recourse to the inflated skin called *kirbah*, (vulg. *girib*). The inhabitants of Sindh on the Indus use a large earthen pot; on the Malabar coast and at Madras the poorer classes use a piece of wood or two roughly bound together called a "catamaran", for a float; but here, where they have no clay to make earthen pots and no wood to make catamarans, they substitute the skins of sheep.

The *kirbah* is commonly used by the inhabitants of this coast, from Ras Rues where I first saw it to the village of Hasek, in Curiyah Muriyah bay. But with the poor Whebah at Shebalah

[1] قربه

its use is seen in perfection. So soon as a shoal of fish, to wit "sardins," is viewed from the heights by those who are watching for them, the whole assemble and seizing their skins and castingnets rush to the water's edge. Here the skin is quickly soaked and inflated, after which the hind and fore legs are tied together with a string. Thus prepared they step into the ring and slipping the skin up towards the lower part of the stomach, throw their castingnets across the left shoulder and wading into the water up to their necks, sit upon the string which rests against the back part of their thighs, and thus paddle away with their hands to the place where the fish are. In this way I have seen as many as twenty at a time enter the water and swim out to a distance of two miles. When they have arrived among the fish they throw their castingnets, and gathering them up return to the shore with what they contain, having no means of securing the fish on the spot.

To give some idea of the poverty of these people I may mention that their castingnets were made of cotton twisted into the coarsest cord, and the sinkers attached to their circumference, instead of being composed of small pieces of lead, consisted of stones half as large as a man's fist with holes in them. Lieutenant Wellsted speaks of the Janahab fishing for sharks on the *kirbah* on this coast [1].

From Ras Abu Ashrin, in lat. 20° 58′ N. and long. 58° 44′ E. we stretched over to the island of Masira, about sixteen miles nearly due south, and there anchored off Ras Alf the N.E. end of this Island. Not, however, without the Whebah having earnestly persuaded us not to go on shore there, as the Janabah, the inhabitants of the island, whom they considered the most treacherous and wicked people in the world, had sworn to murder the first boat's crew who landed on it.

Of this, however, we took no heed, although we were not without suspicion; but the Whebah were right, the Shaykh of Masira, Salim bin Hamed, had resolved to meet us with the reception mentioned, and would have done so but for the interference of his nephew the Shaykh of Sur, who came down on purpose from that place to com-

1 Trav. in Arab. Vol. I p. 79.

pel his uncle to withdraw his opposition; and the latter did so, but most unwillingly for he continued to evince his displeasure towards us, by never coming near us during the whole of the time the island was being surveyed. The Shaykh of Sur's interference was a matter of policy no doubt, on account of the number of bagalos trading between Sur and Bombay, and Arab-like, he concluded that any offence offered to the crew of the "Palinurus" by his uncle, would be visited on the head of the first of the family that the Company or the "Sirkar" as they term it, could lay their hands upon. This probably induced him to become our mediator, and to keep us privately informed, which he did, of every thing that was going on at Masira.

Without following the line of survey all round this island which would be tedious here, I will immediately proceed to its description.

Masira is of an irregular oblong form, constricted in the middle, and narrowed at each extremity. Its longest diameter is N.N.E. and S.S.W., and amounts to thirty-five miles; and its greatest breadth is nine miles, while its shortest breadth in the centre is only four miles and half. A chain of mountains traverses it longitudinally, from which long ridges extend to all the principal capes, and shorter ones branch out almost all over the island. The highest mountain is only 600 feet above the level of the sea, it is in the N.E. half of the island, and is called Jibal Madrub [1]. At a distance these mountains have a conical appearance but on closer examination are found to be rocky, and irregularly pointed. I saw no lava in the island the whole time I was there. The rocks geologically speaking are chiefly of primitive greenstone, serpentine, trap and basalt, with here and there limestone. In the N.E. half of the island there is a tabular tract of limestone about two miles long, and half a mile broad raised upon the greenstone, about 400 feet above the level of the sea. It contrasts remarkably in its horizontality and color, with the dark rugged igneous rocks around and beneath it. There are other small patches of limestone similarly

[1] مدرب

situated; and at the S.W. extremity of the island is a mountain of it. The plains of the island are sandy, and mostly confined to its inner side, where they extend from the base of the mountains to the sea, above which they are only raised a few feet.

So far as vegetation goes, the island may be said to be almost barren. There is hardly any trace beyond a small herb or two on the mountains, and on the plains nothing beyond a few dwarf babal and tamarisk trees, some herbaceous shrubs, and the matted tufts of grass before mentioned, scattered here and there. A small garden exists in the centre of the island from which we got a pilgrim's gourd, and here and there about half a dozen groups of date-trees in not more than three of which are there fifty, and in the rest hardly more than half a dozen in each, all looked ill-watered and ill-nourished.

The wild animals consist of gazelles, and small gray rabbits exactly like the English wild rabbit but not more than half its size. The domestic animals are sheep, goats, dogs, cats and fowls. Sheep and goats are few from the want of pasture, and an old wrinkled bull which was presented to us for our Christmas dinner, was the only head of cattle on the island. Good water is to be obtained throughout the year, a few feet below the surface on the inner side of the island towards its centre.

The inhabitants live chiefly on this side, it is most sheltered and offers most plains. They are with the exception of a few families of the tribe of Hakiman[1] (Okman?) all Janabah, and may number about 1000 souls.

Their food consists chiefly of fish, turtle and dates, and occasionally a little rice and flesh, but the latter are considered great luxuries and fall to the lot of very few. It is customary for many of the women and children to frequent the rocks daily at low-water to eat shell-fish. This they are said to do more particularly when their husbands are away, and they have no one to catch other fish for them. Our Masira pilot Dalkhan, on landing, always went to the rocks and ate a species of shell-fish called chiton, as people would eat bread, and yet

1 عكمان

his rations on board were both in quantity and quality far superior to any thing he could have ever before met with. The island of Masira abounds in the bones of turtles which are strewed over its surface; this shews how much the inhabitants live on them; but the dish of which they are most fond, consists of boiled gray mullet. These fish frequent the shores in large numbers, and as the breakers curl over, are seen through them, ready to swim up with the wave, and feed on the worms washed out of the sand; at this time the fisherman rushes into the froth and foam, when the mullet cannot see him, and casts his net, in which he is almost always sure to enclose several.

On the inner side of the island are several small groups of huts. Coming from the N.E. are Argit [1] and Dua, [2] and then Om Rasas, [3] Safaij[4] and Sur Masira.[5] Om Rasas is the only place worth mentioning. It contains a round mud tower, and several houses, and probably about 500 inhabitants. It is situated about the centre of the island opposite an offset of the main channel. The shaykhdom of Masira belongs to the family of the shyakh of Sur, hence there is much intercourse between these two places. Among the perquisites of the shyakh of Masira, are said to be the heads of all turtles and porpoises caught around the island, as one of the perquisites of the shaykh of Raidah a town on this coast near Ras Bagashwa, is said to be the unborn young of sharks caught near that place.

At Om Rasas there is a Lutean, a member of the Kojah cast (500 of whom live at Mutarah near Maskat), who acts as Banian or Merchant, and Banker. He supplied us with rice and was very civil to us.

The staple articles of the island are shark-fins, dried shark and seer-fish, and *dibbal* or the horn of the inedible turtle. A good set of shark-fins will sell for four or five dollars at Maskat, and the horn of a large turtle if of good quality from ten to eighteen dollars.

The inhabitants of Masira have four bagalos, twenty large badans, and thirty fishing boats.

There are many veins of copper ore in the island of Masira, and

1 عرجيت 2 دوة 3 ام رسيس 4 سفايج 5 سور مصيرة

they have been slightly worked; for an account of these I must refer the reader to Art. VII. No. XI. of this Journal.

The S.W. half of the island is nearly uninhabited. It is here that the few families of the tribe of Hakiman or Okman, who people the bay of Hashish on the oposite coast, reside, at a place called Gairen or Karun about eight miles from Om Rasas. The extremity of this part of the island which is called Ras Abu Rasas is the resort of fishermen during the fair season to catch and dry and salt seer-fish and make porpoise oil. The seer-fish abound at this cape and are caught with a hook and line or in a sein as mackarel are on the coast of England when they pursue the "bait" or small-fry close to the shore. Indeed the seer-fish is in appearance but a mackarel, of a much larger growth, being sometimes four or five feet long. It is extremely rich and of a delicate flavor, hence its Persian name *shir mahi*, or milk-fish.

The turtles abound between Masira and the mainland, but more particularly in the neighbourhood of Ghobat Hashish, where they are said to almost swarm. There are two kinds, the edible, probably *Chelone mydas*, and the inedible *C. imbricata* or hawks-bill turtle, both common to the Indian Ocean. They grow to much about the same size, one of the former for which we gave two rupees weighed 266 lbs. The latter, or inedible turtle as it is termed from being much less fleshy and much less fat, yeilds the turtle-shell of commerce. They are caught by being turned on the back when they come on shore at night to lay their eggs, or harpooned in shallow water, with a barbed loose spear-head fixed to the end of a long bamboo. The spear-head catches in their back, and having a small rope attached to it the turtle is thus pulled on board. The inedible turtle is much scarcer than the edible one. I did not see a specimen of the former all the time I was at Masira, though many pieces of its shell were brought on board for sale. It is taken off the carapace by lighting a fire under the latter; the carapaces of both species are used by the Arab-fishermen for fire-places in their boats.

Ambergris is also sometimes found on the shores of Masira as well as on the opposite coast. While we were anchored off Ras Abu Rasas a Beni Bu Ali fisherman ran his boat alongside and through

my scuttle handed me a piece worth upwards of a hundred dollars, judging from its weight. He stated that while shark-fishing on the coast southwest of Masira he had gone on shore with two or three others, and had found some Beduins hacking a large mass of it with their swords, who not knowing the value of it, allowed them to take it for a few dried fish. The portion handed me by the Beni Bu Ali was his share of it. It was evidently the segment of a large sphere formed of thin layers, consisting of the ink and undigested beaks of cuttle-fish held together by a substance like cholesterine. I was struck with the analogy that it bore to the hair-ball found in the ox's stomach, particularly when I considered the close relation that exists between the whale (*physeter maccocephalus*, from whose intestines it is said to come), and the ox. This coast abounds in the sperm whale and several other species of cetacea, and of course with myriads of cuttle-fish and cephalopds of all kinds on which the former feeds.

It is stated by the Arab fishermen that sharks are so fond of Ambergris that wherever there is a piece floating, for it is very light being resinous, it is almost sure to be surrounded by several sharks gnawing at it. Once while fishing in the straits of Masira we saw something floating a few yards off, and great fish biting at it; when one of our Beni Bu Ali pilots who was with us, suddenly leaped into the water and swam to it. He told us after his return that he thought it had been a piece of ambergris but it turned out to be a dead cuttle-fish, much to his disappointment.

The channel between Masira and the mainland is about ten miles wide, and so shallow that the greater part of it is nearly dry at low water. It gradually deepens from the mainland, (which is here on a level with the sea,) outwards, so that the only navigable part is found close to the island of Masira. Channels of course exist in the other parts, but these are more or less shallow and irregular in their course. There are several islands in it; some of which only appear on the receding of the tide, and others only prove their positions by the ripple over them. Opposite Om Rasas there is a long sandy island covered with mangrove, on the borders of which are myriads of wading birds,

such as Flamingos, Curlews, Plovers, etc. who assemble there to feed at low-water.

Further towards the S.W. are two other islands formed of black basaltic rocks. One, the largest, is about 100 yards long and formerly was covered with guano, but with the exception of a few cart-loads, then scraped together there, the whole had been carried away. The inhabitants told us that it had been carried to Makalla and to places on the coast and in the Red Sea, to manure tobacco ground etc. Here and there rocky reefs come very near the surface in this channel, between Ghobat Hashish and the S.W. extremity of the island of Masira.

On the outer or sea side of Masira there is nothing remarkable but the headland called Ras Jah, which is the extremity of a great spur from the main range of mountains, extending outwards from the N.E. half of the island, and again a little to the N.E. of this is a small island close to a cape, called after it Ras Jazirah.

The climate of Masira and that of the opposite coast when we were there, during the months of December, January and February 1845-46, was very delightful. The temperature seldom exceeding 72° and 74°. Fahr. in the gun-room. Captain Wellsted states (Travels in Arabia Vol. I. p. 81) that invalids from Maskat frequently come to reside in this direction for the benefit of their health, probably during the winter months, for during the summer it must be intensely hot, since there are no rocks, no trees, nor anything else on shore to afford shelter from the sun's rays direct or reflected.

As to the religion of the Janabah at Masira, it is almost impossible, as I before stated, to say what it is from their religious observances. I never saw any of them say their prayers. Our Masira pilot Dalkhan never said any prayers, nor did I ever see any of the Whebah say their prayers, nor any of the tribe of Hakiman whom I encountered. Moreover, an elderly man of the latter, whom we met at Gairen and who shot a Gazelle for us there, ate heartily off a piece of a salt beef we had brought on shore, he and his children, and took the rest home. The absence of religion and religious observances among these tribes is not to be wondered at, for the inhospitable nature of the country

they inhabit would effectually oppose any continued attempt at their instruction or enlightenment. Nothing but such fanaticism as existed in the early part of the Mohomedan era could induce people to come and dwell in such a place and among such tribes for the purpose of teaching them their religious duties, and we see how long this has lasted.

Let us now return to the mainland, to Ras Abu Ashrin which we left, and continue our examination of the coast south-westward. Up to Ras Abu Ashrin, although we had long lost sight of all mountains inland, yet the coast continued upwards of 100 feet above the sea. We now come to a part where it is nearly on a level with it; the only instance of the kind unbacked by mountains on this coast.

This flat land which is opposite the island of Masira is continued on from Ras Abu Ashrin to Ghobat Hashish, a distance of thirty nine miles, where the same kind of sand-hills are met with as those at Shebala, most probably a continuation of them, limiting inside the flat land, which presents nothing remarkable beyond a few scattered bushes of tamarisk and salsola, and a few tufts of grass and rushes.

To ascertain that there was no highland in the neighbourhood, I took particular care while on some of the most elevated parts of Masira to examine the in-shore horizon both with my naked eye and with a telescope, and I saw nothing whatever but a vast extent of white sand-hills bounded by a misty horizon. I have already stated that the high mountains of Jallan and Kalhat were seen from the deck at our station twelve miles S.S.W. of Ras Jibsh, that is a, distance of 70 or 80 miles, while from the highland of Masira which is at least 400 feet above the level of the sea I could discover nothing above the common level of the country inland. It is as I have before said to this part of southern Arabia that the Arabs give the name of Baten or low flat-country, it forms the south-eastern part of the great desert of Akaf.

From Ras Mashub, which corresponds to Ras Abu Ashrin in being the south-western extremity on the coast of the flat just mentioned, and the last point of the mainland opposite Masira, the coast trends westward, and continues in this direction for about twelve miles, when

it again turns to the northward, and after six miles more, ends at Ras Shijar, the eastern point of the entrance to the bay called Ghobat Hashish. The shore thus described forms the southwest boundary of the flat land between Ras Abu Ashrin and the bay last mentioned. It was here that the American ship "Peacock" grounded and was set upon by the Beni Hakiman, some members of whom came on board the "Palinurus" and told us that they were of the party, and were surprised that as the vessel had stranded on their coast they were not allowed to claim her. They seemed to be very cheerful people and expressed themselves very glad that we had come over to their coast, for they had been impatiently waiting for us ever since they had heard the nature of our duty. It was therefore a great disappointment to them when they were told that we were going away immediately. Captain Sander's object having been merely to carry his triangulation from Masira to the mainland and then bear up for Aden, to get fresh provisions, for scurvy had broken out among the crew. I therefore did not see Ghobat Hashish [1] which is the only part of this coast that I have not seen.

Lieutenant Grieve, however, who returned to survey it the following year kindly favoured me with a sketch of it, and some observations on the nature of the surrounding land which will enable me to describe it almost as well as if I had been on the spot.

Returning then to Ras Shijar the eastern point of the entrance to Ghobat Hashish, the coast curves inwards and northwards from it for about ten miles, in a circular form, and then outwards again to Ras Ghidau, the opposite or western limit of this bay, which is eight miles distant from Ras Shijar. In the space thus described which is nearly dry at low water in its inner half, there are three islands, called respectively, Ab, Mahut, and Rak.

Lieutenant Grieve states that Jazirat Ab, which is situated towards the opening of the bay, "is a small rocky islet frequented only by natives for curing fish."

[1] حشيش

"Jazirat Mahut is a low island" about two miles long by one broad, "covered with Mangrove Bushes [1] and surrounded by mudflats which are dry at low water. It contains about 130 huts and 500 inhabitants of the Beni Hakiman (Okiman?)[2]. This tribe is scattered over the country from Ghobat Hashish to Suadi, a town about thirty miles west of Maskat. They are numerous but not powerful. Their chief's name is Nassar bin Saed." The Beni Hakiman inhabit the coast as far as Ras Sarab, twenty miles from Ras Ghidau, and from Ras Sarab to Ras Hammar, a distance of twenty five miles, are the Wahebah, after whom come the Janabah again. The Wahebah must not be confounded with the Whebah, they are two different tribes, separated from each other on the coast by the Beni Hakiman.

Leaving Ghobat Hashish, we find the coast running nearly due south for 100 miles, to Ras Jazirah, and curving at the same time a little westward between these points, in scollops, between which again are the headlands about to be mentioned.

The first, after Ras Ghidau at the entrance of Ghobat Hashish, is Ras Mintot, then comes Ras Sarab where Lieutenant Grieve states there are " a few huts with about 100 souls of the tribe of Wahebah whose chief's name is Khalfin bin Ali." After this, Ras Kabret, where there are a few miles of sea-cliff about 300 feet high, the first *bona fide* sea-cliff we have had since leaving Ras el Khabba near Ras el Had. (We have now returned to the white or fawn colored compact lime-stone of this coast, latterly we have had nothing but white loose calcareous sand). There is a break now, after which the cliff is again continued on almost uninterruptedly to Ras Jazirah. Opposite this break is the small rocky island of Hammar el Nafur, about three miles off shore. This island Lieutenant Grieve states, "is about 400 yards long by 300 broad, and 300 feet high, and of a white aspect. The summit is flat and split in all directions. Myriads of shags frequent it, and there is an accumulation of guano on it which is occa-

1. It is probably from this circumstance that the bay gets its name of "Hashish," *herba.* We took in a cargo of wood from this island, while at Masira, which contained the largest trunks of Mangrove trees I have ever seen.

2 عكمن

sionally taken away by the Arabs for the purposes of agriculture." The rock-specimens of this island sent me by Lieutenant Grieve show that it is composed of white lime-stone similar to that of the coast. Next to Ras Kabret comes Ras Kariat which is 280 feet high, and then a table-land on to Ras Markas (480 feet high) and Ras Jazirah.

Hence we see there is a gradual elevation of the land towards the south, and from Lieutenant Grieve's sketch it appears that this commences as far northward as the bottom of Ghobat Hashish, although we do not come to any cliff until arriving at Ras Kabret. We also see by the eastern aspect of this part of the coast, which amounts to a distance of 100 miles between Ghobat Hashish and Ras Jazirah, that this elevation is not confined to the sea-cliff but that it extends inland for at least the distance mentioned. It remains to be seen if this general elevation of the land commencing here, continues. Up to Ras Kabret, with the exception of a few insignificant points, we have had no cliff whatever since leaving Ras el Khabba near Ras el Had; we now come to a table-land at Ras Jazirah which is 480 feet above the level of the sea.

After leaving Ras Jazirah, the land falls back a little and for upwards of eighty miles to Ras Sāgar [1] is confronted by a low sandy shore out of which is scooped the Bay of Sāgar. From Ras Sāgar which is 622 feet [2] above the level of the sea, a cliff is continued on for upwards of thirty miles to Ras Shaherbataht, and Ras Gharau which last is 800 feet [3] above the sea. Next to it, is a little salt water lagoon with fresh water at its inner extremity, and a break of four or five miles. The sea-cliff then recommences at Ras Minji, 706 feet high [4] and is continued on uninterruptedly to Ras Shuamiyah, when again the land recedes and is again also confronted for upwards of fifteen miles by a low sandy shore. After which a cliff is continued on almost without interruption to Ras Therrar where it ends, about twelve miles from the south western extremity of Curiyah Muriyah Bay.

From Ras Jazirah to Ras Therrar therefore, a distance of 170 miles, the land has been gradually rising from 480 to 800 feet above the

1 Chart by Captain Haines. 2 Capt. Haines. 3 Id. 4 Id.

level of the sea, which it is more or less in Curiyah Muriyah bay; and it may be easily conceived that such an imperceptible elevation, gives it the appearance of a tabular plain the whole way, which is the case. But for the sandy beaches mentioned, and the outbreak of black igneous rocks at Ras Jazirah and at Ras Shuamiyah, the seacliff would have been continuous throughout, and have presented a light white color, a parallelism of strata and an uniformity of surface, almost uninterrupted to the neighbourhood of Ras Therrar. When sailing along it I could not help being struck with its resemblance to that part of the coast of England between the North Foreland and Beachy Head,

"——that pale, that white-faced shore,"

but without a tree and almost a mound to vary the outline; nothing but one continued light brown, barren, arid limestone rock from Ras Jazirah to Ras Therrar.

At Ras Jazirah there has been an outbreak of igneous matter which has upset the limestone strata much, and the little island at its extremity which forms a part of the former, and from which the cape takes its name is composed of serpertine. At Ras Shuamiyah also there has been an outburst of igneous matter but to a much greater extent. Many dykes and dislocations appear here, through which the dark igneous rock has forced its way, and overflowed the surface. Indeed the horizontality of the land generally, begins here to be disturbed.

As I merely passed along this part of the coast, and was not present when it was surveyed, I must refer the reader to Captain Haines' account of it published in the XVth vol. of the Royal Geographical Society's Transactions.

There are no trees to be seen upon it, and no traces of vegetation, saving a few bushes in the sandy plains close to the sea, neither in all probability are there more than the desert-herbs to be found inland. It appears to be totally uninhabited, save by a few Janabah here and there where there may happen to be a little water, as at Ras Gharau, or where these people may be temporarily located during the fair or fishing season; for this is the great fishing coast of the Beni Bu Ali and

Janabah. Some of them make three trips a year from it to Maskat, gaining by each trip fifty dollars.

The southwestern extremity of this barren tract, brings us to the borders of a far different country. One mountainous and woody, fertile and populous, rich in flocks and herds, the region of frankincense and wild honey, in short "Araby the blest." It begins in the southwestern horn of Curiyah Muriyah Bay [1].

On approaching it, while leaving the islands of Jibliyah, Gharzaut, Hallaniyah, Soda, and Haski on the left, we are struck by the sudden elevation of the land, which here rises from 800 to 4,000 feet. I have already mentioned the derangement in the horizontality of the strata which appears to commence at Ras Shuamiyah, and this increases on to Ras Therrar, when all at once the white cliffs are seen 4,000 feet above the level of the sea. The summit of Jibal Hasek, which is within four miles of Ras Therrar, is 4,000 feet above the sea. From this point the line of elevation appears to extend due north, much in the same way as we have seen it between Ras Jazirah and Ghobat Hashish. This is as it were the second step of elevation westward.

From Jibal Hasek, a table-land of the same height, extends northwards and westwards, called Jibal Sabhan, accompanied, as all such elevations are, by deep ravines and huge isolated masses at its circumference. These between Jibal Hasek and Ras Nus, the extreme point of Curiyah Muriyah Bay, are extremely fantastic in their outline.

1 Could Curiyah Muriyah, written خرتان مرتان (el Edrisi) when applied to the islands of this bay, but with the diacritic points altered خريان مريان, be derived from Karah Mhara, كرة مهرا? The shores of Curiyah Muriyah Bay are inhabited by these two tribes, and the inhabitants of the Curiyah Muriyah islands speak their peculiar dialect. Moreover Captain Haines (2d memoir p. 136) states that the Khalfan tribe of the Mhara claim this group of islands and visit them once a year; while the late Dr. Hulton (Proceed. Bombay Geographical Society, December and February 1839-40, p. 189) states, that the inhabitants "assert that their ancestors came originally from the neighbourhood of Hasek and Marbat." The islands themselves are named after the nearest places on shore, and from their appearance. Haski from Hasek, Hallaniyah from Ras Hallan near Hasek, Soda from its black color, Jibliyah from its mountainous appearance, Gharzaut perhaps from being nearest Ras Gharau.

Jibal Nus, at the base of which is the cape of the same name, is only 1,200 feet above the level of the sea, and is stated to be composed of granite [1].

Next to Ras Therrar comes Ras Hasek, and the village of Hasek, both situated at the base of the mountain just mentioned, and between these two capes is the valley called Wadi Rakot, which must be one of the largest on the coast, as it is said to extend seven days' journey inland, to a country and town called Jezzar. [2] Hasek is inhabited by members of several tribes, the principal of which are the Karah, [3] Mhara, [4] Afar, [5] Hassarit, [6] and Baramah. [7]

Five miles south of Hasek, towards Ras Nus, is the tomb of the prophet Houd, Kabar Houd, as it is called. It is situated at the foot of the most remarkable of all the mountainous masses on this coast. This mass consists of a serated mountainous ridge of at least four peaks, each of which is about 3,000 feet high, the direction of the ridge is S.W and N.E. The peaks are called Jibal Habareed, more probably Kabar Houd, from the tomb of Houd lying at their base. The people of Hasek, however, call this the tomb of Sāleh bin Houd.[8] Sāleh is said to have lived between the time of Houd and Abraham. Houd was the prophet sent to reclaim the Adites, Sāleh, the tribe of Thamud, from idolatry. [9]

On rounding Ras Nus, about four miles further on, we immediately lose sight of the even and comparatively low land behind, and open upon a plain of dark igneous rocks in front. This plain which extends to Ras Marbat, and about ten miles inland, is backed by the seaward scarp of the table-land of Subhan just mentioned, which here in the form of an enormous cliff descends almost in one step to the plain below, while at the top are the white lime-stone strata raised three or four thousand feet above the level of the sea.

From Ras Nus to Ras Marbat, which is the next cape, there is nothing remarkable on the shore but the isolated mountain called

1 Captain Haines, 2d Memoir p. 129. 2 Idem p. 131.

3 كرة 4 مهرا 5 عفار 6 حسريت 7 برمعة.

8 Capt. Haines, 2d Mem. 9 Sale's Koran, prelim. disc. p. 9.

Jibal Jinjari, which is about 1,300 feet high. It is small and conical, and affords a distinct geological type of the neighbouring formation, from being situated in the midst of the plain of igneous rocks mentioned, and separated for at least ten miles on all sides from any highland.

The mountainous tract of Sabhan is continued on, under different names and without interruption beyond that of a deep ravine here and there to the N.W. point of the Bay of El Kamar, distant 180 miles from Ras Nus. Some parts of it towards the sea, are perpendicular, but most descend to the sea or maritime plain, called *sahil,* in subranges of mountains or slopes more or less sudden and precipitous.

The summit of this land is said to be almost barren and soilless, presenting hardly any trees beyond that of the frankincense and milk bush, a species of euphorbia, it is called the Nejdi. At a lesser elevation called the Gathan, the tops of the mountains present more vegetation, and still lower are covered with a rich red loam, abundance of long grass, and a variety of shrubs and small trees. While the slopes of the mountains are also thickly wooded with balsamic and other small trees to the Sahil, and sometimes to the water's edge, even portions of the lime-stone rock in the midst of the sea, have old balsamic trees on them. Large herds of cattle are seen grazing on the grass, flocks of innumerable white goats and sheep are seen scattered over the sides of the mountains or following each other in long dotted lines among the crags, and camels are said to be proportionably plentiful.

The habitations of man here, are for the most part, in the rock. They dwell in natural caverns, some of which are of enormous dimensions, and as these are for the most part situated on the precipitous portions towards the sea, their position and number may be distinguished when night comes on by their lights.

From Hasek to the town of Damkot in the Bay of El Kamar, the mountains are inhabited by the Beni Karah, whose chief or representative of their head family, in 1846, was Salim bin Thori bin Kahtan, of the family of Bin Kahtan. Behind the Karah inland are said to come the Thor, then the Mahra, the Afar also a large tribe, and the El Kathiri.

Of the Beni Karah I have given a short description in the Xth and XIth Nos. of this Journal, to which I must refer the reader, merely stating here that they subsist chiefly on milk and flesh, and exchange ghee (clarified butter), hides, frankincense and moql (bdellium), for the few necessaries they require.

I passed a day in one of their caverns situated among the mountains a few miles from Takah, a small village on the coast about eight miles west of Marbat. This excursion I will briefly detail, as it will give some idea of the dwellings and life of those who inhabit caves on this coast. The way to it is through the dry bed of a torrent which ends two miles east of Takah in a saltwater lagoon called Khor Reri. After having traversed this for upwards of a mile, in company with the Beduin chief to whose cavern we were going, his brother who lived at Takah and our Arabic Interpreter, we arrived at a point where the torrent bed divides into two branches, the right branch of which is after a short distance suddenly stopped by a precipice about 250 feet high, and the left continued in among the mountains. Having followed the former to the precipice, we scaled this, and on arriving at the top found a grassy plateau about a mile square, circumscribed on all sides by mountainous slopes except towards the sea, where it was bordered by the edge of the precipice mentioned. It was this precipice and this plateau that attracted our attention from the vessel and that induced me to obtain if possible a nearer view of them.

There were many wide-spreading trees on the plateau and part of it was under cultivation. A stream of water meandered through it from which some little negro boys, slaves of the Beduin chief, were conducting off minor streams to irrigate some beds of indigo, onions and corn, while the remaining portion trickled over the precipice. There were also pomegranate, fig, and lime trees there.

As I have before stated, this plateau was surrounded by mountainous slopes on three sides, and about 100 feet up the face of the eastern one was the Beduin's cavern, the arch of which was about 150 yards span; its height about fifty yards and its depth about thirty. In front of it was a fence of brushwood which made the area within large enough to hold 100 head of cattle, which were penned there during

rain or the predatory visits of marauding members of the tribe. The roof of the cavern was hung with stalactites and its margin festooned with creepers.

Here we passed the greater part of the day with our friend the Beduin and his brother, wife and family. There were many recesses in the cavern, partly perhaps the work of man, partly that of nature. In some of these, hersdmen and other dependents of the Beduin chief resided; they occupied the opening, while the deepest and central recess of all was occupied by the Beduin's family. This had a raised floor of brushwood, supported on stakes, three or four feet above that of the cavern. The wife of the shaykh of Takah was there for her health; she also had an apartment. So soon as we ascended the platform of brushwood, a persian rug was spread for me and a bowl of milk brought. I passed the day partly in conversation, partly in presenting presents, but principally in prescribing for and in looking at the diseases of people of the cavern, and of others of the neighbourhood who came to see us. The Beduin's wife made one of the party. She was a light colored, fine, handsome woman, but the shaykh of Takah's wife kept herself concealed in her recess although she talked to us out of it.

When the heat of the day had subsided, we descended to the plateau, and walking towards its inner part came to a long irregular canal or lake which they called Khor Darbot. Its widest part was about thirty yards, its depth about twelve feet, and its length about a mile and a half. Trees spread their branches over some parts of it, and here and there tall bull-rushes bordered it. A number of waterfowl were reposing on its surface, and many head of cattle belonging to the Beduin, grazed on its banks. Every thing appeared peaceful and quiet. But the watchful eyes of the armed Beduins who were with us shewed how every thing might in a moment be reversed.

Having reclined for a short time under the shade of one of the trees, while the Interpreter who was a Persian, bathed and said his prayers, we then walked to the western extremity of the canal, where we found the little stream which I have mentioned, issuing from it, and the sun having set, to us at least in this mountain dell,

we turned our steps towards the corner of the plateau by which we had entered. On our way, we passed a great cavern, which had recently fallen in, and whose occupants, like their opposite neighbours might have tenanted it for generations, but had been compelled at last to seek another abode. When we arrived at the corner of the plateau I took a final glance at this pretty place, and with the rest of the party descended to the torrent-bed beneath. From thence we made for the shaykh's house at Takah, where we arrived somewhat after dark, and having related to him the adventures of the day, got him to put us on board the "Palinurus" in one of his boats, where we arrived about midnight.

Both the shaykh of Takah and the Beduin chief, did all they could to prevail upon us to stay at their respective dwellings, but circumstances prevented us from accepting their hospitality.

Having now described the habitation of a Karah in the mountains, let us descend to the plains on the coast, (here called *sahil*), of which there is only one between Ras Nus and Wadi Shagot at the bottom of the bay of El Kamar. This is eighty miles long, and extends from Ras Nus to Ras Resut, after which the mountains slope to the sea in precipices or shelving steps all the way to the valley mentioned.

Commencing then with the village of Marbat, which was the starting point of Captain Haines' survey towards the N.E., and that of Captain Sanders' towards the west, we find it situated at the bottom of a little bay of the same name which is protected by the low cape of Ras Marbat already mentioned. This cape is the western extremity of the tract of low igneous rocks which first opened upon us on rounding Ras Nus.

The village of Marbat contains about twenty houses, and 200 inhabitants, of the Beni Karah tribe. Around the houses are ruins of others of a more ancient date from which the newer ones appear to have been constructed. This is commonly the case with the villages on this coast. The original material appears to have served for ages, and in the walls of a miserable habitation may frequently be found stones which have had a better place.

Many of the Karah who dwell in the plain around Marbat have nothing beyond the shelter afforded by the overhanging sides of watercourses, under which whole families reside. Clothes they have little or none, neither have they any arms, and their food consists almost entirely of shell and other fish which they grope out from among the rocks on the coast.

Little as this may appear to accord with the great advantages of this district, it is nevertheless true, for ample as its resources may be to supply the wants of man, the Karah of the plains are so divided among themselves, and so subject to the predatory descents of those who live in the mountains, that the solitary inhabitant of the dreary waste we have just passed, leads a life of more security and comparative happiness than the richest man in the plain we have now come upon.

Many of the Karah of Marbat serve on board Arab Bagalos which trade to India, Africa, and other parts of their own country. Marbat is a common place for vessels sailing along this coast to water at, although the water is so brackish that it is hardly drinkable, at least to those who have been accustomed to better; but about four miles west of it, there is a mountain rivulet of excellent water, which descending to within a few hundred yards of the shore, enabled us to replenish our tanks there.

On the inland side of Marbat are some granite rocks about 100 feet high and behind them is the Burial Ground of the village. There are several old tombs in it, in ruins, and one bearing the date A. H. 557. Many of the Karah are buried here, and they still keep up their old custom of killing a bullock over the grave of the deceased and distributing the meat to the poor who may have assembled to receive it. There is also a stone close by the Burial Ground which marks the place where the greater part of the Karah of this district bring their children to be circumcised.

Beyond the granite rocks, inside this again, is the debouchement of a great mountain torrent which during rainy weather, that is in the S.W. monsoon gathers the water from the neighbouring parts of the Subhan mountains, and pours it into the bay of Marbat. It was stopped up by

a sand bank several feet high which had been formed by the torrent on one side, and the sea on the other. The bay of Marbat is open to the S.W. monsoon.

Proceeding from the debouchement of this torrent-bed on towards the village of Takah, already mentioned, a distance of about eighteen miles, we find a narrow *sahil* between the base of the mountains and the sea, the whole way. For the first four miles it is nearly on a level with the sea, but afterwards it rises to the height of 100 feet, which it maintains with the interruption only of a mountain torrent-bed here and there, all the way to Khor Reri, the lagoon which I have stated to exist two miles east of Takah. After this it is continued on with a sea-cliff of the same height for about a mile, when it sinks into the famous plain of Dofar [1], which is but a few feet above the level of the sea, and at which we now arrive.

The village of Takah before mentioned, is situated about a mile beyond the termination of the sea cliff, and consists of a few mud and stone houses, surrounded by heaps of stones as the houses at Marbat, the remains of former buildings. On the bluff which terminates the cliff are also the remains of some old houses, and the shaykh of Takah told us there were others in the neighbourhood, but that there was no traditional history connected with them further then that they had been erected by a family called Min Gui, the same people who built the city of El Balad now in ruins in Dofar, of which hereafter.

Between Takah and the cape called Ras Resut, before mentioned, a distance of about thirty miles, is the fertile plain of Dofar, raised but a few feet above the level of the sea. This plain, which is by far the most favored by nature on this coast, is bounded on one side by the sea, and on the other by a deep incurvature of the mountains. Its eastern extremity, which is about three miles wide opposite Takah, passes into the narrow strip of *sahil* mentioned, and it terminates westerly in a *cul de sac* between Ras Resut and the great mountainous tract of the coast, while it extends backwards in its deepest part from ten to fifteen miles.

[1] ظفار.

There are several fresh and saltwater lagoons in this plain. The former seem to be formed from fissures in the ground opened by some terrestrial convulsion, and are all filled with water to the brim; the latter are at the debouchements of water-courses which pass across the plain to the sea.

The soil of Dofar is rich, and the remains of agricultural marks shew that at different periods it has been generally under cultivation. When the coast line of this plain was being surveyed in 1844, large tracts of it were covered with maize and millet. There are also several groves of cocoanut trees on it which yield large nuts.

For the protection of the cultivated parts, towers have been erected, from which watchmen discharge their matchlocks on the approach of suspicious characters. But this I am told is of very little use, for the inhabitants of the mountains who are the principal depredators in this case, linger about during the day at a distance with their flocks or herds, and when the night comes, turn them into the young corn and eat the whole down in spite of every thing. This but too frequently ends the labours of the industrious inhabitant of Dofar, who has no appeal, nor dares interfere with the impudent intruder, a hair of whose head if injured, would bring his whole clan down upon the unfortunate agriculturist, under pretext for further dispossessing him.

Hence it follows that the greater part of this fertile and well watered plain remains uncultivated, and most of the inhabitants reduced to the greatest want, from their almost inevitable issue of their labours. I have seen men going to till the ground here with their sword in one hand and their hoe in the other.

The towns of Dofar are congregated about its centre, near the sea, probably for mutual protection. They are five in number, viz. Dairiz, Sillalah, El Hafah, El Robat, and Aukadh. The three former are situated around the ruins of an ancient city now called El Balad on the sea shore. Of these ruins I have given a full description in the VIth Vol. of the Journal of the Royal Geographical Society, also in the Transactions of the Bombay Geographical Society Vol. VII. and must refer the reader to it for more information on the subject. El Robat is a little distance inland towards the mountains and has been

deserted on account of the continued predatory visits of the Karah, while Aukadh is on the coast a few miles west of Sillalah.

The inhabitants of the plain of Dofar are partly Karah and partly El Kathiri, and so deeply involved in blood-feuds that there are hardly two people among them who are not afraid to pass each other. Scarcely an inhabitant of one town dares go to another without a protector, called a *rubiya*, who is bound to take upon himself the insults offered to the man whom he protects. But these seldom amount to any thing serious, for the *rubiya* being friends with all, few will open a blood-feud with him for the sake of being revenged on the man whom he protects, hence the latter is able to transact his business and return to his home with perfect security.

The inhabitants of this district, therefore, live in a most frightful state of anarchy. They are in constant fear of each other and in terror of a descent of the Karah from the mountains. Indeed their condition is as unhappy as can well be conceived, and this they bear in their countenances. Not only the people of the plains but the principal people of the mountains are extremely anxious for the protection of a good government. The former hailed with delight our arrival there hoping that it was the object of the "Sirkar" to take possession of the country, and so persuaded were they of this, from the wish being father to the thought, that one of the principal shaykhs, a Karah chief, (with whose brother I had resided a few days during our first visit to Dofar), told me in confidence the number of men he could assemble at a short notice and his willingness to place them at the "Sirkar's" disposal. This was the shaykh of Aukadh, a good old man, but depressed in spirit, and worn down by the intestine quarrels of his tribe. He took me into the farthest recess of his house to make this confidential statement to me.

I passed a few days at Sillalah in 1845 and in 1846. The first time with the brother of the old man just mentioned, and the second in company with Lieutenant Grieve at the house of a Sharif named Saiyad Tahr who was a merchant, trading to Bombay and other ports. During the last time I saw the head chief of the Karah, Salim bin Thori bin Kahtan, to whom I have already had occasion to allude.

It was he who killed in a blood-feud, fourteen years before that time, the last Governor of Dofar, Saiyad Mohammed bin Akil. He with other members of his family, all tall, fine looking people, the finest Beduins indeeed I ever saw, had come down from the mountains partly to see us, and partly on business with Saiyad Tahr. They wanted us much to return to the hills, and pass the monsoon with them. One day I saw Saiyad Tahr make an exchange of three or four yards of blue dangaree (cotton cloth) with Salim bin Thori for a couple of bullocks, and on observing that it was a good bargain, the Saiyad replied "but who will buy the bullocks?" this remark was quite sufficient to disabuse me of the idea, had formed respecting the advantage gained by the Saiyad.

During the S.W. monsoon, the wind and waves and sand are said to render Dofar so disagreeable, that the principal inhabitants retreat to the mountains, where they would appear to have estates and cattle.

They all as well as the Kahtan family pressed us to pass the monsoon with them, intimating that we were tempting Providence to leave the bay of Resut at that time, viz. the month of June. This would have afforded us excellent opportunities of becoming better acquainted with the life and habits of the Karah in their mountain recesses, and no doubt with the family of Bin Kahtan, we should have been perfectly safe, for it is stated that fifty of the Kahtan family are enough to put to flight the whole of the Beni Karah.

The plain of Dofar after the rains is said to be covered with an incredible number of sheep and cattle. Horses they have none, or not more than half a dozen, miserable creatures.

In several parts of the plain of Dofar there are ruined towns like those of El Balad. They amount to six in number, and are said to have been built by the Min Gui, of whom, see the description of El Balad to which I have alluded.

Passing on to the westward, we come to the bay of Resut where the plain proper of Dofar ends; for the *sahil*, though continued on in the form of a *cul de sac* for some distance, becomes broken up and

elevated upwards of 100 feet above the level of the sea. The coast line at the end of the plain proper, curves southward, and running for, a little towards the S.E., then turns again to the west, to form the cape of Resut, inside which is the bay and bunder of the same name. This bay affords safe anchorage to small vessels during the S.W. monsoon. The "Palinurus" remained there from the 25th May to the 3rd June 1840, and the bay was perfectly calm, though the southwesterly swell was rolling past the cape with nearly the whole force of the monsoon. There was also a large Bagalo laid up there for the monsoon, belonging to our friend Saiyad Tahr, and half a dozen boats belonging to Mharah fishermen, who had come from Saihut and Damkot, to fish for shark, which abound in the bay of Resut during the S.W. monsoon.

The premonitory swell of the S.W. monsoon called *tadbir* had commenced long before we had arrived and was gradually increasing. Its duration was said to be about twenty days when the *karif* or S.W. monsoon, fairly sets in. This varies a little but was expected when we were at Resut, on the 10th or 12th of June. The only fear in the bay of Resut is about ten days before the *karif*, when they say there is sometimes a gale from the S. or S.E.

In the comparative geography of this coast the bay of Resut will be found of much interest, for being the only one of the kind hereabouts which answers to the description of the Author of the Periplus, who states that sailing along this coast from Malabar or Broach, vessels when too late in the season put into a bay here for the monsoon, (*"quæque (naves) à Limyrica aut Barygazis veniunt eo deferuntur, sero anni tempore hyemen ibi traducentes,"*) we are enabled to obtain the identity of a point which is most desirable.

At the bottom of this bay is a sandy beach about a mile long separated from the plain of Dofar by a few hundred yards of low sea-cliff. It is backed by a ridge of sand of the same extent, within which comes the khor or lagoon of Resut. This, which consists of several pools of stagnant salt water, intergrown with mangrove bushes, tamarisk and salsola, is the debouchement of a large torrent bed, which coming through the *cul de sac* mentioned, gathers the water during the rains from the neighbouring mountains and pours it into the bay of Resut.

It is probable that this lagoon becomes much extended during the rains, when it must overflow or pass through the sandy bank which during the fair season separates it from the sea. I do not know if they have much rain during the monsoon in these parts but they have some. About a mile up this torrent bed is a bubling spring of brackish water, but drinkable, and half a mile still further on another perfectly fresh. This torrent-bed corresponds with the one which we have seen at Marbat, in collecting the water from the neighbouring mountains at this end of the plain and pouring it into the bay of Resut.

The small cape which shelters the bay of Resut from the S.W. monsoon, is the commencement of a low scarped ridge, which extending westward about ten miles meets the main tract of mountains as the latter advances southward to form the great promontory called Ras Sajar. It is between this ridge and the mountainous tract inside it, that the *cul de sac* is, which forms the western extremity of the district of Dofar.

The cape of Resut is about 200 feet high and about a mile broad at its base, and prolonged into the sea by a little island or rock from which it is separated by an interval of a few yards. It is composed of the white and gray limestone of the coast and is much scarped, and irregular on the summit from denudation.

On its extremity are the remains of a small round tower of rude construction and also those of buildings equally rude.

About half a mile from the latter, still on the ridge of the cape, comes an ancient Burial Ground extending over an area of three acres. The graves are marked by nothing but a circle of large boulders, surrounding a heap of loose stones or what formerly was a heap of stones sunken in the centre. The larger of these graves measure from six to twelve yards in diameter and are raised two feet above the level of the plain. They are formed of boulders of white and gray limestone gathered from the immediate neighbourhood. Around the large graves are smaller ones looped on to their circumference, indicative of successive additions to them of less distinguished members of the family or tribes, perhaps, unless all perished in battle and were buried at the same time. No one could give us even

a traditional account of these graves. We endeavoured to raise the stones from the centre of one, but after descending about four feet and a half below the surface they became so large and so locked in that although we had three or four stout Sidis with us and a good crowbar we could not move them, and had we succeeded, the chances are, from the hurried manner in which we were obliged to make our examination for fear of being surprised by the Beduins, that we should have found little to have rewarded us for our pains. Besides the Burial Ground and the ruins mentioned, there were the remains of buildings in all directions about this cape, although there is not a human habitation now within ten miles of it. Hardly any of these remains amounted to more than a few stones which mark the area occupied by the original building.

The graves as well as the heap of ruins at this cape were overgrown with the moql tree and its companion the *balsamodendron pubescens* of Dr. Stocks, also the miswak which threads its way abundantly through the crevices between the boulders. In many places the trunks of the former measured four or five inches in diameter, and their branches growing horizontally from their exposed position, had extended completely over some of the graves. This shews that both graves and trees must be very old.

For the sake of those who may hereafter visit this neighbourhood I may mention that, though presenting many objects of interest, it is most unsafe; each time that we were there, parties of officers who had gone on shore were shot at. In the first instance the party was about seven miles from the shore, up the bed of the torrent mentioned and but for the presence of a Karah guide who kept the assailants at bay while the party made the best of its way back to the shore, one or more would have been wounded if not killed on the spot. In the second instance, a party who had gone to some rocks to gather oysters were surprised and shot at, and but for the impatience of the assailants in commencing their attack, one or more here would have been wounded or killed; as it happened, they had not lowered their sail and got off with merely a part of the gunwale of the boat shot off. This party of Beduins had come down from the mountains to intercept the return of Lieut. Grieve, myself and others, who had been on a visit to the Saiyad mentioned, at Sillalah,

Having however got intelligence of their design and having been persuaded to stay another day, we did so, and eluded them. The Beduins were probably not prepared with water or provisions to stay longer than the day on which they expected us and so discharged their matchlocks upon the party who went to gather oysters, after which they might have returned to the mountains, at least we saw nothing of them the next day.

The Mahrah fishermen at Bunder Resut were always obliged to have a protector or *rubiya* with them. An old Karah always accompanied them to the spring up the torrent bed when they went to fetch water.

It is quite possible to go about this place unprotected for many days together without seeing a single human being, as I have learnt from experience, but the risk is very great and the people so bad that they would shoot a man from a distance merely for the chance of his possessing anything worth having.

From Ras Resut the sea-cliff again commences and extends westwards for twenty-three miles to the mountainous tract extending outwards to form Ras Sajar.

There is nothing remarkable in this cliff the base of which is washed by the sea the whole way, except the peak of Ras Hammar, which is the highest point of it, this is 700 feet above the level of the sea. From the summit of these cliffs the land slopes inwards to the *cul de sac* mentioned, and its highest parts are covered with a coppice of small gum trees, such as I have mentioned to exist at Ras Resut.

The junction of this cliff with the promontory of Ras Sajar brings us again to the great mountainous tract which we left on the sea at Ras Nus, and which there, was known by the name of Subhan, but here is called Sajar.

Ras Sajar is the largest cape on the S.E. coast of Arabia though not the most striking; it is not a long projecting cape but of stupendous magnitude and height. Although Ras Fartak appears to be as grand in its dimensions as a cape can well be, yet the ridge of Ras Sajar exceeds it in height by nearly 900 feet. The summit of Ras Sajar is by trigonometrical measurement 3,380 feet above the level of the sea and its bluff extremity 2,770 feet, while the ridge of

Fartak is only 2,500 feet and the scarped portion towards the bay of El Kamar 1,900 feet.

The eastern side of Ras Sajar, which is not so high as the southwestern, on account of the strata dipping towards the east, is perpendiculary scarped and its base is concealed by the debris of superincumbent masses of limestone which have rolled over or fallen from its summit. The southwestern side however is not perpendicularly scarped, but descends in three or four grand steps to the sea, the ledges of which are so narrow that from our station within half a mile of the base we could see the summit. The bluff extremity of the cape is perpendicular to the water's edge.

All round Ras Sajar the soundings are very deep, but particularly at its extremity and southwestern side, at these parts no bottom was found at 100 fathoms a mile off shore, while the next throw of the lead landward might strike at 60 fathoms. This shews the gigantic steps with which the land here decends even after it has passed into the sea.

We anchored in 60 fathoms, within half a mile of the shore, on the southwest side; it was our last station working eastwards. The wave off the shore here was half as high as the wave on and the wind in like manner. This was of great assistance to us in getting off, for both the southwesterly swell and the southwesterly wind had commenced, and we were on a lee shore.

Where the sides of this cape are not perpendicular they are covered with trees, and the plains above with long grass. We observed more caverns on the eastern than on the western side of this cape, in the way I have before mentioned, viz. by their lights at night.

From Ras Sajar to Ras Fartak, a direct distance of 105 miles, the coast was surveyed by Lieut. Grieve. The distance between Ras Resut and Ras Sajar is about twenty-six miles.

On the southwestern side of Ras Sajar, about six miles from its extremity, is a deep ravine running northwards, called the Kais ibn Othman. At its opening is the village of Safgot consisting of one large house and a few small huts with the usual heaps of stones, the remains of former buildings, around them. The shaykh of this valley (May 1846.) was a fine old man by name Saiyad bin Othman

el Sadoni. He was said to be very rich in flocks and herds, being possessed of 200 camels, upwards of 500 head of cattle, and 1,000 sheep. We had not an opportunity of landing at his place but he sent his boat off to enquire if we wanted anything, and afterwards came to Sillalah to see us, and finallay on board the "Palinurus." He was excessively desirous of not being passed over, having heard that we had visited other chiefs before him on the coast, and therefore travelled over the great promontory of Ras Sajar to meet us in Dofar. It was this old man who told us confidentially at Sillalah, that the Karah intended to intercept our return to the vessel.

Close to his romantic valley is another similar one, called the Kais ibn Ammar. Its direction also is northward and it is separated from the former by a mountainous ridge scarped upon the sea. At its entrance also is a village, called Rakot, consisting of about half a dozen houses and about 50 inhabitants. The shaykh of this village and valley (May 1846) was an elderly man by name Said bin Ammar, I passed a day and a half with him.

In the evening of the day I landed, he took me for some distance up his valley the sides of which were thickly wooded with small trees, among which he pointed out two leafless ones apparently acacias, from which gum arabic was gathered. The gum which was shewn me was clear and colorless, not the so called gum-arabic which comes from the Somali coast, and which has a tinge of yellow. There was also the moql tree there, the gum of which they call *tabka;* its companion also the *balsamodendron pubescens,* and another balsamodendron which is common to this coast, even to Aden, and yields a gum which is chewed, called *liban dokat,* when the bark of this tree is cut the juice flows forth like milk. The *Sibroot* tree was there (a species of Euphorbiaceæ ?) yielding a red astringent gum like kino, and which the Arabs mix with *subr* (aloes) to use as an external application for sore eyes, wounds &c.—the *nerium obesum* so common on the limestone rocks of this coast, and a thousand other small trees for the most part leafless. Drawings of some of these with specimens of their gums were forwarded to the Hon'ble the Court of Directors in April 1848.

After the shaykh had pointed out everything which he thought

interesting in his valley, particularly a crevice in the ground between some limestones whence he said during and after the rains issued a great stream of water, and of which he wished to know the explanation, we arrived at a large tamarind tree, into which he climbed and threw me down some of the dried fruit, stating that it was the largest tree and bore the best fruit of any in the neighbourhood, also that the Beduins in their ascent and descent of the mountains halted under it and refreshed themselves with its fruit. The polished state of the blocks of limestone under the old tree and the remains of fire places bore ample testimony of this.

Night coming on we returned to his house and after partaking freely of boiled kid, rice, and dates, retired to the house-top to pass the night.

It was to this place that a Mahrah had come all the way from Damkot, sixty miles off, to get me a branch of the frankincense tree in flower, in hope of being rewarded for it by a small present. It took him twenty-four hours to get it and he went back rejoicing with a dollar.

A little further, westward of the Kais ibn Ammar comes a third ravine or valley, which hasa west northwesterly direction. It is called Kharifot and has a stream of water running through it. It appeared rich in vegetation and at its entrance was a large grove of date-trees.

These three ravines are all close together and within fifteen miles of the extremity of Ras Sajar. There is only one more of the kind throughout this range which is Wadi Shagot.

Next to the ravine of Kharifot, which is separated from the Kais ibn Ammar by a low mountainous ridge covered with long grass and stunted trees, and scarped upon the sea like that separating the latter from the Kais ibn Othman, comes a place called Shalgot, where the summit of the highland falls considerably back and afterwards descends in long shelves to the sea. These shelves are covered with grass and trees. We saw a date-grove there and a great many cattle.

After a few miles the upper line of the coast again comes forward and the slope becomes more sudden, to form the cape called Ras Tharbat Ali, which is considered the eastern limit of the bay of El Kamar.

From Ras Tharbat Ali to Ras Fartak is considered the extent of the bay of El Kamar, and within these limits there is no cape of any consequence. The highland continues on from Ras Sagar under the name of Jibal Kamar, and borders on the sea from Tharbat Ali southwestwards for about thirty-five or forty miles without *sahil*, when the coast-line curves round, a *sahil* commences, and the mountainous range continues on in its original course. From the point where the coast-line leaves the mountains the land continues on to within twelve miles of Ras Fartak, where it meets the range of mountains which extends southwards to form this promontory.

Returning to Ras Tharbat Ali, we find this cape does not project so much into the sea, it is the acute angle which is formed by the falling back of the upper line of the coast that follows it, eastward, which gives it a prominence, rather than any anything else. This cape is said to terminate westward the coast-line of the Beni Karah.

From Ras Tharbat Ali which is about 200 feet above the level of the sea, the land gradually increases in height to Damkot [1] the next place on this coast, where it is 3,000 feet high. Throughout the greater part of the way it slopes from an almost unbroken outline above, in shelves, clothed with grass and small trees almost to the water's edge. This part is called Jibal Kamar or Shaher.

On approaching Damkot, the slope from the summit of the high land becomes more rapid; it also becomes more broken, and ends before arriving at this place in being both mountainous and precipitous. Opposite this part too, the soundings are very deep. We were anchored in twenty-eight fathoms about a mile off shore and about half a mile further out there was no bottom at 220 fathoms.

We now come to Damkot, the principal sea-port, indeed the only one, in the bay of El Kamar. This is the eastern limit of the coast-line of the Mahrah. Between Damkot and Ras Tharbat Ali the ground is said to be neutral and inhabited both by Karah and Mahrah.

Damkot (in lat. 16° 34′, N. and long. 52° 52′ E.) is situated on an irregular sandy plain about a mile square, and bounded on all sides except towards the sea by almost inaccessible mountains. Behind

[1] دمكوت, Would not these names of places terminating in *kot* or *ot*, be better spelt *ghot*, غوط, *terra cava depressiorque?*

it there is a tortuous ravine which leads up to the highland above, but it is so insignificant in point of size that it would pass unnoticed if not purposely sought for. In front a tongue of land extends outwards from the beach which ends in a reef of rocks on which the waves break 250 yards off shore. This divides the little beach into two parts, the eastern half of which admits of safe landing for boats when the south-westerly swell is not very heavy, while the western is al unapproachable at such times. A small stagnant salt-water kh or lagoon exists on the west side of the plain and around it are a few miserable looking date-trees.

The plain of Damkot is sandy and uncultivated and the sides of the mountains are barren for upwards of 1,000 feet, above which they are covered with grass and small trees and bushes, such as have been before mentioned.

There are about ninety flat-topped mud-houses at Damkot; about thirty on the west and about sixty on the east side of the khor or lagoon. The remains of an old round tower built of mud and stones are situated on a bluff about two hundred feet high above the western part of the town.

There is a very extensive Burial Ground there, in which are many ancient graves similar to those at Ras Resut; that is, consisting of beds of stones encircled by large boulders, while the more modern ones have ridges over them marking the longitudinal axis of the body laid beneath. The latter most probably commenced with the introduction of Mohomedanism, the former being the graves of the old Pagans.

Allowing six souls to each house the fixed population of Damkot would amount to about 540. But there are many more than this there during the fair season, when the Beduins from the interior bring their gums, hides and ghee to exchange for grain, cloth and other necessaries.

During the S. W. monsoon almost all retire to the mountains. The population consists principally of Mahrah, but there are a great many Karah, and they seem to mix very freely together. The latter call themselves Koreysh so did the Beni Ammar at Rakot. Karah and Koreysh therefore would seem to be synonymous.

The inhabitants of Damkot have about forty boats all of which are light and rudely built, sewn together, but well fitted for their rough shore. In the fair weather they are chiefly employed in shark fishing. The seer-fish is seldom met with here.

We obtained a good supply of sheep at Damkot, also a bullock or two, but the beef on this coast is execrable in flavor, and the cattle so wild and so savage that when brought on board they dash from side to side, and try to bite and kick every thing that comes near them.

The route to Hadramaut from Damkot is not up the ravine mentioned at the back of the town, but by sea to Ghraidah[1] first, a place situated inshore, a little further on.

There is a wildness about the neighbourhood of Damkot and an oldness in the appearance of the place, together with a peculiar expression about the people whom I saw there, that gave me the impression, whether from association or reality I know not, but I think from the latter, that it was the most ancient looking place and people I had seen on this coast. Doubtless the place is old and the people have never had much intercourse with strangers, for it is the only sea-port of this district, and the produce of the surrounding country has probably ever been very trifling.

The mountainous land extending for eight miles westward from Damkot to the ravine-like Wadi Shagot before mentioned, is called Hadthob. Like that about Damkot it is more or less precipitous towards the sea, and divided by depressions above into domed shaped summits, which are covered with grass and small trees such as have before been mentioned. There are many caverns also in the precipitous parts towards the sea and many of them inhabited, as we could see at night by their fires.

Wadi Shagot, which is the last remaining ravine in the bay of El Kamar, ends upon the coast by a narrow opening, but seems to expand out interiorly.

Opposite this valley, the *sahil* or sea-plain again commences, by a narrow slip of sandy beach, the margin of which tends slightly southwards; while the mountainous range continues on in its original

1 غيطة

course south-westward, under the name of Fattak,[1] that is after the opening of Wadi Shagot.

Behind the mountainous land of Hadthob is said by the Mahrah to come that of Heiden [2] and north of this the land of Akaf, *aradh el hagaf*, as they call it.

From the commencement of the sandy slip of beach the coast-line curves round from W. S. W. to S. and continues low to a place called Khalfot, about fourteen miles north by west of Ras Fattak, and about fifty miles from Wadi Shagot. The land both on the coast and inshore as far as the eye can reach, westward, seems hardly anywhere to exceed 100 feet above the level of the sea. At Khalfot it meets the lower hills of the Fartak range. This range after a course of six miles north by west from the extremity of the cape suddenly turns westward, and afterwards seems to run parallel to the Fattak range. The lowland which intervenes between the two, the "ghob el Kamar" of Edrisi, is continued on westward as far as the eye can reach, without any alteration in the general level of the country or any appearance of the "moon-shaped mountain" at the bottom of it which that author has described.

In some parts of the coast-line the land is scarped on the sea, while in others the scarped part is more or less inland and gives place in front to sandy plains intersected by shallow lagoons.

There is hardly a trace of vegetation to be seen throughout the whole of this uneven lowland. It appears, with the exception of a few desert herbs, to be entirely barren.

At the point where the coast-line turns southward from its former direction is the little village of Arnub, where there are a few date-trees, and a few miles further inland under the Fattak range is the town of El Ghraitha already mentioned, around which also are some date-trees and apparently a little cultivation.

It is by El Ghraitha that the people of Damkot go to Hadramaut as before stated. Every third or fourth day when there are a sufficient number, a kafilah is said to leave this place for the province of Hadramaut. The journey is stated to occupy fifteen days and the

1 فتک 2 حیدان

road to be nearly level all the way. The course is S.W. over the lowland between the Fattak and Fartak ranges, and the only annoyance said to be anticipated is a plundering attack from the Mahrah Beduins. There is no other territory between El Ghraitha and Hadramaut but that belonging to the Beni Mahrah.

Between Arnub and Khalfot there are only two little villages called respectively Hirot and Dthabot.

At Khalfot there is a saltwater lagoon about 300 yards long with two fathoms of water, where three or four Bagalos are laid up during the S.W. monsoon.

Immediately after this the land begins to rise rapidly to the ridge of the Fartak range which is about 2,500 feet high; this runs southwards to the cape and westward inland. Khalfot is just at the outside of the bend.

The sea-cliff, which at Khalfot is about fifty feet above the level of the sea, also increases rapidly in height with the land, and soon arrives at a perpendicular escarpment of 1,900 feet which it maintains on to the summit of Ras Fartak. The upper line of this cliff corresponds in its irregularity to the depressions and elevations at the summit of the range while its base is concealed by the sea. It is by far the grandest escarpment on the S.E. coast of Arabia, indeed I expect there are few which can compete with it anywhere in this respect, being uninterruptedly perpendicular from top to bottom for an extent of six miles from the cape. Although its surface appears perfectly smooth yet it is so deeply weather worn into shelves, that men live on them and descend by them to within a few feet of the sea below. We saw these people, never without their swords even in such places as these, fishing from the lower shelves, and in the evening, their fires in different parts of the cliff. It was terrific to behold their position, but in all probability the enormity of the masses prevented us from forming a just estimate of the width of the shelves and the risk they ran; they might have had plenty of room where we thought they could hardly stretch themselves out at full length. Our Pilot however who was a Mahrah from the village of Haswel (el Suahil?) close by, told us that it was a very common thing for them to fall over and be drowned.

No part but the summit of this range presents any vegetation and this is chiefly seen on the western side, where the range gradually slopes to the plain below. Indeed the barrenness of the Fartak range generally, as well as that of the land on each side of it, seems to shew that we have left the part of this coast which catches the rain of the S.W. monsoon, for I can hardly think there is much difference in the soil. It was here, though, on a portion of the face of the cliff which had fallen down, on the eastern side towards the bay of El Kamar, and had made a heap of rocks projecting above the surface of the sea at the base of the escarpment, that I first saw the frankincense tree in leaf. The seed or tree had been brought down with the white limestone mass, which seemed to have slid from the face of the cliff. It was growing out of a crevice of the bare rock according to the habit of this tree.

We now arrive at the extremity of the Fartak range, called Ras Fartak, which next to Ras Sajar is the highest and largest promontory on the S.E. coast of Arabia. Like Ras Sajar, it is scarped to the sea on its eastern, and slopes rapidly to the plain on its western aspect. It is not perpendicular at its extremity as Ras Sajar, but descends so gradually that its base is extended southward a mile beyond its summit. The real extremity of the cape is not in the direction of the ridge, but to one side, where the coast changes its direction from south to west or to south-west. It is this sudden turn connected with the presence of such a high and narrow range isolated from all other mountains, that makes this cape, although it is not the largest, the most striking on the S.E. coast of Arabia. As I have before stated, the Fartak range extends backwards from the cape north by west for about six miles after which it suddenly turns westward. At the extremity of the cape the range is about two miles wide at its base and a short distance inland it spreads out to about double that extent, but it continues narrow to its bend.

It was on the extremity of this cape that I saw for the first and only time a balsamodendron, if not the same, closely allied to the specimen of the myrrh tree figured by Nees ab Esenbeck (*Plantæ Medicales*). A sketch of it was sent to the Hon'ble the Court of Directors with the others before mentioned. I made repeated enquiries after the

myrrh tree on this coast but never could obtain any information of it. All said that it did not grow there.

From Ras Fartak to Ras Sharwen, [1] the next prominent headland, a distance of about 58 miles, the coast runs W.S.W and for the most part is only raised a few feet above the level of the sea. This distance may be again divided by an intervening cape called Ras Darjah [2] situated a little to the west of midway between Fartak and Sharwen. Between Ras Fartak and this cape, a distance of twenty-five miles, there is a sandy plain raised a few feet above the level of the sea, and a few villages on it near the latter, which, with their cultivation are protected from the wind and spray by a sand-bank about fifteen feet above the brow of the beach. Close under Ras Fartak are some mud-huts called Khaiset, after which on the coast come the villages to which I have alluded, viz. Kadifot, Haswel, and Sakar; and inland in the internal angle of the Fartak range, to which the sandy-plain extends, is the town called Wadi. This low coast is continued on about W.S.W. for fourteen miles to a small saltwater lagoon called Khor Makshi, when it curves round to the S.E. and then S.W. again to form the step-like cape called Ras Darjah.

This cape which is about 200 feet high and scarped on all sides, is the S.E. point of a group of low rocky mountains which extends inland to join the lower hills of the Fartak range, and also along the coast to the plain of Kashn [3], around which they wind inland to the high isolated mountains behind this place, called Jibal Jahun.

Inside Ras Darjah is a shallow bay with a rocky reef or island in it just peeping above the surface of the water.

From Ras Darjah the sea-cliff is continued on diminishing in height for four or five miles, when it, with the elevated land adjoining becomes concealed under a large tract of sand which is continued on to the plain of Kashn.

The high mountains inland north of Ras Darjah which seem to be the continuation of the Fartak range or tract, after it has turned to

[1] شروين [2] درجة [3] قشن

the westward, are called Jibal Adim, and those behind the plain of Kashn, Jibal Jahun.

For a description of Kashn I must refer the reader to Captain Haines' 2nd memoir; and for further observations on the Mahrah of the coast with a vocabulary of their dialect, see No. XI of this Journal p. 340.

From the plain of Kashn, which is bounded on the S.W. side by the mountainous tract extending out to Ras Sharwen, the coastline curves round to the S.E. until it arrives at this cape, where it again turns to the S.W. The plain of Kashn accompanies it in a narrow slip to within two miles of the cape, where the land becomes precitous to the water's edge, and gradually descends from 1,800 to 200 feet which is the height of the extremity of the cape. The curvature thus formed by the coastline gives rise to a small bay called the bay of Kashn.

A short way inside the cape is that part of the bay which is protected from the south westerly swell, and where Bagalos belonging to the inhabitants of Saihut and Kashn are laid up during the S.W. monsoon, *close to the shore,* it is called Bander Lask. This brings us to Ras Sharwen which, if Ras Sajar and Ras Fartak be remarkable for their magnitude, is not less remarkable for its peculiarity, which consists in the presence of two natural pillars on its summit, that may be seen sixty or seventy miles distant.

The bluff of the cape is as before stated not more than 200 feet above the level of the sea, which is ten fathoms deep close to it. It is scarped on all sides, but more particularly towards the sea, and is formed of the extremity of a long wedge shaped mountain which, after rising gradually westwards for about three miles, terminates in an angular summit 1,800 feet above the level of the sea. By the side of and to the west of this summit are the two pillars mentioned, which appear to be formed of the same kind of white lime-stone as that of the the mountain on which they are based, they are about 100 feet high and situated about 150 feet from each other. Each is four sided and rounded at its extremity, and the easternmost is shouldered. I do not think there is any thing of the kind more remarkable on this coast

than these tow pillars, they look in form like two huge crystals. I regret much that I had not an opportunity of visiting them, to be certain whether they were the work of nature or man, or whether they had any writing on them; but I hope this will be accomplished some day, as the ascent to them from the inner side of the cape offers no difficulty whatever. I endeavoured by the aid of a telescope to discover if there were any characters on them and could see none, but we were never I think within five miles of them.

The mountainous tract in the neighbourhood of Ras Sharwen which joins with the mountains behind Kashn and is continued westwardly, is much disturbed and broken, and a mass of basalt is seen in the cliff four miles west of the cape which has been pushed up, so far, towards the surface.

Proceeding from Ras Sharwen to Ras Bu Gashwa, a distance of eighty-six miles, we find the coast runs about W.S.W. and presents neither head-land nor inlet of any consequence the whole way; while the whole mountainous tract between these two points is continuous, with the exception of the openings of Wadi Masilah and Wadi Shikawi, of which I shall speak in their turn.

After a distance of about eight miles from Ras Sharwen the sea-cliff, which is here very irregular, ends, and the highland receding from the sea gives place to the commencement of a low shore, which after a short distance widens out to a breadth of ten miles, this it maintains more or less to Ras Bu Gashwa.

Immediately west of Ras Sharwen is an extensive tract of sand which covers the rocky masses beneath, like that on the other side of Kashn. These tracts appear to have arisen from the disintegration of the upper part of a yellow sandy deposit a few feet in thickness, which here, in some places, overlies the hard white lime-stone formation of the coast. At the western termination of this sandy tract near the sea is the village of Atab, and between this and the commencement of the low shore, nothing but a few rocky and insignificant head-lands intervene, the last or westernmost of which is called Ras Agab.

A few miles further on, after the lowland has commenced, is the town of Saihut distant from Ras Sharwen twenty miles. For a des-

cription of this place as well as the village of Atab I must again refer the reader to Captain Haines' second memoir. The former is the port to the valley I am about to mention.

Opposite the town of Saihut the mountains begin to fall back to form the eastern boundary of the great opening of Wadi Masilah, and fifteen miles further on, about three miles inland is the attenuated spur or angle of the opposite range, which forms its western limit; from these two points the opening narrows inwards to a gorge which leads into the valley, and from this again on either side, the ridges, which are here low, gradually rise to the height of the opposite mountainous tracts, so as to give the valley a crescentic form.

Wadi Masilah is certainly the grandest of all the valleys of this coast which open upon the sea, and running inland seem to divide the mountainous land of Southern Arabia into separate tracts. Its width and the height of its sides appear enormous, and like the "Devil's Gap" its summits are almost always bound together by overhanging clouds.

The inhabitants of Saihut state that it leads into the province of Hadramaut and that it continues in the country of the Mahrah the whole way, also that it is densely populated by this tribe. A stream of water issues through the gorge during the rainy season, and at its opening there are several date-trees, a few houses and some old castles in ruins, one of which situated on a little hill near the sea, appears to have been a square building with a turret at each angle. Its exports consist of goats, millet, and frankincense, which are exchanged at Saihut for wearing apparel and other necessaries. I regret that I had not an opportunity of obtaining more information about this valley.

From the western side of Wadi Masilah the mountainous tract is continued on under the name of Jibal Assad, [1] sometimes descending in precipitous slopes, at others by subranges of mountains and hills, to the plain beneath. It presents nothing remarkable and nothing to interrupt its continuity but the opening of a tortuous valley called Wadi Shikawi, the whole way to Ras Bu Gashwa. But this is not the case

1 Captain Haines' 2nd Memoir.

with the *sahil* or sea-plain below, where there are a series of horizontal effusions of black basalt that rank among the most remarkable features on this coast.

These are three in number and are called by the Arabs the "Harieq" or burnt place. They commence immediately west of Wadi Masilah and are continued on to the neighbourhood of Ras Bu Gashwa. Each is accompanied by one or more cones about 100 feet above the level of the surrounding ground, and around each cone for a variable extent, is a low field or tract of basalt, so strikingly defined by its blackness and the light color of the *sahil* over which it has spread, that but for its being unattended by any active signs of volcanic eruption it might be taken for a semifluid mass of lava.

The first cone is about four miles west of Saihut. Its effusion has extended nearly to Wadi Masilah on the east, and joins with that of the following cone on the west.

The next cone is opposite Wadi Shikawi about nine miles from the last and about three miles inland. Its tract extends westward to the neighbourhood of Raidah, a village about eighteen miles distant.

In the centre of the third tract, which extends westward to Raidah, are four cones, and this effusion having taken place over ground for the most part 100 feet above the level of the sea, has found its way into the water-courses and appears at their openings on the shore in black rocks, contrasting strongly with the white color of the limestone on each side. The plains of the lower mountains here, also appear to be darkened, perhaps by ashes which were ejected from the cones or craters.

I explored a little of the second or middle tract, which extends over at least 150 square miles, at a place on the shore called Masainah, opposite Wadi Shikawi. It consists of large boulders of black basalt of different shapes and sizes, and just at this spot the molten mass appears to have passed over the beach into the sea. There is of course hardly any trace of vegetation on it, and the heat from it in the month of May was almost insupportable.

These black tracts as I have before said, are called by the Arabs the "Harieq" or burnt place, from a superstitious belief that they re-

present the ashes of seven Pagan cities which were burnt down by the Imām Ali, when he was sent into Yemmen in the tenth year of the Hijra to propagate the Mohammedan faith.

Connected with these volcanic effusions appears to be the shoal of Abdu'l Kuri, called by Captain Haines "Palinurus Shoal." It is about ten miles off shore opposite Wadi Shikawi, and its highest point has only four fathoms of water over it. The extent of the shoal is 1850 yards in a N.N.E. and S.S.W. direction, and it is from 300 to 600 yards broad. Captain Haines states "the soundings measured from the shoal spot gave 80 fathoms at one mile distance to the S.W., and 64 feet at two miles distance to the S.E. In every other direction they exceeded 100 fathoms at this distance. At two miles distance from the shoal spot towards the shore, the soundings were 120 fathoms."

Again opposite the town of Raidah, there is a pit from 120 to 135 fathoms deep close to the shore with 20, 30, and 40 fathoms all round it. Such irregularities in the bottom of the sea do not exist again throughout the whole of this coast, and I cannot help thinking that they are connected with the volcanic vents on the shore immediately opposite, both the shoal and the deep pit may have been of this nature, one a cone, the other a crater.

Opposite Wadi Shikawi also, is Masainah the place before mentioned in lat. 15° 3′ N., and long. 50° 43′ E. It is situated immediately inside the sandy beach at this spot. There is a depression here, about two miles long and half a mile broad, which is the termination of a torrent-bed, probably coming from Wadi Shikawi. It is about thirty feet below the plain behind, and about five feet below the ridge of the beach in front. At its eastern end is a pool of salt-water, and a black-looking quadrangular mound, and at its western extremity a salt-water lagoon, about one mile long and two hundred yards broad, surrounded by a dense thicket of mangrove trees; while between the two are several mounds formed of black basalt, on which are the huts of a few fishermen.

On the quadrangular mound at the eastern extremity of the depressed portion are the ruins of an old building. Hardly anything of this

remains but the foundation, which extends over an area of thirty yards square. The walls were two feet broad and parallel to the cardinal points, two square turrets were at each angle of the building, and on the eastern side of the N.E. angle descending towards the sea, was a flight of steps about nine yards wide. The mound appears to have been built and rebuilt over and over again with insignificant structures, and looks at a distance nothing but a heap of black stones; but the foundation of the original building shews that there was once an edifice on it of some consequence. It was, if we may judge from the foundation, chiefly built of white limestone, probably brought from the neighbouring mountains, in blocks two feet long, each block having what is called a building-face; there were also blocks of black basalt among them, and the mortar, between one and all presented no appreciable difference, so that in all probability these formed part of the original construction.

I carefully examined the whole of this mound and afterwards the immediate neighbourhood, but saw nothing more worth mentioning.

Opposite Masainah about ten miles inland (the breadth of the *sahil* here), is the ravine-like opening of Wadi Shikawi, which is bounded on each side by a rapid descent of the mountainous tracts, to a narrow gorge.

The valley seems to expand out a little interiorly and its direction appears to be N.W. It is said to be a day and a half's journey long, and then to divide into three branches; also to be much cultivated and thickly inhabited by people of different tribes.

The opening of this valley is more beautiful than grand, inasmuch as it is not carried through to the sky as that of Wadi Masilah, but shut up, so to speak, by mountain-peaks in the back ground. Wadi Masilah seems to go direct through to the sky, Wadi Shikawi to pursue a tortuous course. The latter is said to limit the territory of the Mahrah westward.

It was in a cavern of the mountains a little to the east of this opening that Captain Sanders, Mr. Smith, and the late Dr. Hulton, discovered some Hamyaritic characters in red paint. As yet none have been found further eastward.

The Beduins at the town of Raidah, whom we met by appointment on shore at Masainah, offered to conduct us to some places of the kind in the valley of Shikawi, and drew on the sand the very characters we were in search of, but in consequence of the arrival of two other parties of different tribes, and the dispute which ensued respecting the right of shore, and that of presents, and then an indiscretion of one of our party, which nearly brought us to a direct fight, we declined the offer of our Raidah friends, and thought ourselves not a little lucky when we got back to the "Palinurus" in the evening, with our skins sound. As it was we were obliged to leave a hostage (voluntary), and return the next day with presents to ransom him. But for this indiscretion which led to a want of faith on the part of the Beduins, we might have gone anywhere.

Excepting a few trees visible by the aid of a telescope, on the summit and sides of the mountainous tract between Ras Sharwen and the neighbourhood of Raidah and Ras Bu Gashwa, the whole coast is barren and uncultivated.

It was at Masainah that Captain Haines' survey, when proceeding eastward along this coast from Bab el Mandab, terminated, and it was also from that place that Captain Sanders' to Ras Sharwen commenced; Captain Sanders having previously surveyed the coast between the last named cape and Ras Fartak. I must therefore refer the reader for a description of the remaining part of this coast to Captain Haines' first memoir, and conclude my observations on it with a few general remarks.

Proceeding from Masainah westward, we find the *sahil* still flat, and but a few feet above the level of the sea, until passing the village of Raidah, when it begins to rise gradually, and with it a sea-cliff commences, which at Ras Bu Gashwa attains an elevation of 300 feet. These cliffs are white, and here and there broken by a torrent-bed, at the opening of which upon the sea is seen the black basalt before mentioned.

The village of Raidah which is about twelve miles from Masainah is about three quarters of a mile inland. It is the first place since leaving Haswel near Ras Fartak, that has presented any cultivation.

The goats of this place are remarkably small, white and spotted, short haired and gazelle-like. One she-goat with kid which was brought on board from Raidah, only weighed four and a half pounds, after having been prepared for cooking. The shaykh of Raidah treated us, as all other shaykhs whom we visited, with much hospitality. He was a Sharif and like the Sharifs generally, possessed that light colored skin, and well fed appearance which contrast so strongly with the dark and wiry figure of the hungry Beduin. He was however affected to a great extent in his hands with the disease called tuberculous lepra, so common in India, in which the phalanges of the fingers and toes drop off at the joints, leaving those which remain, contracted and frightfully distorted. It is said by the people of Raidah, that the heir to the shaykhdom of Raidah is always known by this distinction. Therefore it is probably hereditary, and does not shew itself until late in life, when the shaykhdom is naturally about to descend by death from father to son. It is the shaykh of Raidah too who claims the young of the shark found within the parent, to which I have before alluded when speaking of the perquisites of the shaykh of Masira.

From the people of Raidah I ascertained that which I had been led to expect from personal observation at a distance, viz. that the ruins of an ancient town exist on Ras Bu Gashwa. They are close to the cliff, and cannot fail to strike the eye of a person sailing along this coast. Near them is said to be a hill on which there is some ancient writing; probably that visited by the late Dr. Hulton, and Mr. Smith. There is also said to be more writing among the ruins of an old castle between Raidah and a place called Goseirah, a few miles further west on the coast, probably "Maaba" in which the gentlemen just mentioned, could find no inscriptions. Another place mentioned by the people of Raidah where there is ancient writing, is called Banat Hajam in the mountains opposite Masainah, where I appointed the Beduin party mentioned to meet me to visit it, but as I have before stated we were prevented from doing this by accidental circumstances. The distance between Raidah and Hadramaut, is said to be ten days' journey.

Opposite Raidah the mountainous tract is called Jibal Shamakh, and

the upper line of it falling considerably back, contrasts strongly with that just passed, in attaining its summit much less abrubtly. The latter appears to be lower but this may be caused by its greater distance from the sea.

The *sahil* also here becomes widened, to upwards of fifteen miles, and in lieu of continuing low, or only a few feet above the level of the sea as before, and even on its surface, it is broken up in all directions and thrown into peaks, particularly close to the sea, to wit, Nassar and Manassar, which are some hundreds of feet above the level of the surrounding country, shewing that subterraneous agency probably connected with the extinct volcanos just passed, has been at work here below the surface, and for want of vents has given rise to all this disturbance. There are many hot-springs here, which are said to possess great medicinal virtues, indeed the *sahil* is called Hammam; and from the number of places and ruins, and the cultivation which accompanies the presence of water here, this, next to Dofar, may be inferred to be the most favored part of the coast. It must always have been thickly populated, and therefore it is, that here, close to Hadramaut, where a few Hamyaritic inscriptions have already been found, others and still more valuable antiquities may be sought for, with probable success, and I should think without much opposition or difficulty.

From Ras Bu Gashwa, which is 300 feet high, the cliff continues on with breaks here and there, to the village of Hami, and a short distance afterward ends in a low sandy shore which is continued on to Ras Makalla. Here the highland again advances towards the sea and terminates westward, this, the longest maritime plain or *sahil* on the coast.

Passing round Ras Makalla, we enter the bay of the same name and arrive at the town which has been fully described by Captain Haines, and to whose description I must refer the reader only adding here a few observations on the neighbourhood.

Although the immediate vicinity of Makalla is particularly barren, yet this is not the case a short distance inland. Leaving the town and proceeding along the beach, we soon arrive at the debouchement

of a torrent-bed, where there is a long narrow slip of saltwater, such as is commonly seen at the ends of these places. And following this water-course for about a mile, we come upon some extensive groves of date-trees and a large garden. These belong to the shaykh of Makalla, who has built watch-towers there occupied by his soldiery to protect them from the incursions of the Beduins. The garden is irrigated by a stream of water which is found to be derived from a rivulet that has its source in a rocky ravine of the mountains close by. On pursuing this rivulet to its origin, we find it issuing from a place about 300 feet above the level of the sea, and at a temperature some degrees above that of the surrounding atmosphere. It soon increases in size, and falling over a little precipice into a natural bason, affords a most convenient place for bathing. There are many springs of the kind in the neighbourhood and many holes and subterraneous hollows filled with water in the adjoining mountains. These all pour their contents into the rivulet mentioned, which after a sinuous course would, if its waters were not diverted to the garden, find its way to the lagoon at the debouchement of the torrent-bed. The water is fresh and tasteless, without smell or deposit of sulphur at its source, though attended in some parts by the presence of much magnesian lime-stone in botryodal masses. The place where this spring is situated, is called Bokaren, and the stream which flows from it, is surrounded by date-trees. The inhabitants of Makalla wash their clothes there and obtain their daily supply of water from it.

With this brief description of Bokaren, let us proceed from Makalla along the coast, which now runs S.S.W. At first the shore is low and sandy, backed as usual a few miles inland by low hills and then the great mountainous tract, which is here nearly 6,000 feet above the level of the sea. This sandy shore is continued on to the next cape, called Ras Brum which is composed of dark, brown, peaked igneous rocks that are extended to Ras el' Asidah, and form, with the exception of Ras Rattle which is of white limestone, the principal headlands all the way. They extend a considerable distance inland towards the lofty mountainous tract behind, and attain their greatest height perhaps about Ras Brum and Ras Rehmat, which must be

nearly 1,000 feet above the level of the sea. They are thrown up in ridges which in some parts alternate with limestone and at Ras el'Asidah end in a few peaks and rocks scattered over the maritime plain westward of this cape. This is the largest tract of igneous rocks on the coast, it is fifty miles in extent, which is the distance between Ras Brum and Ras el' Asidah.

The islands of Baraghah, Jibus, and Hallani which are opposite the southwesternmost part of this tract, are all of the white limestone formation of the coast. The rock of Hisn Ghorab from its form and color would lead one to infer that it was igneous, but it is stated by Captain Wellsted (Travels in Arabia vol. II p. 423,) to be composed of "a dark grayish colored compact limestone."

Nearly opposite Ras el'Asidah the continuity of the great mountainous tract is for the last time interrupted by one of these great valleys which lead into the interior. This is called Wadi Meifah and is a most important feature in the comparative geography of this coast. It was here that Captain Wellsted and Lieutenant Cruttenden discovered the ruins of Nakab el Hajar. The entrance to the valley is much further from the coast than that of Wadi Masilah, and is obscured by many high hills between it and the sea, although the great break in the outline of the highland distinctly marks its position. From the western side of Wadi Meifah, the mountainous tract which still continues nearly 6,000 feet high, advances again towards the sea, and about 90 miles N.E. of Aden approaches within half a dozen miles of it, after which it continues to run parallel to the shore for about 60 miles and then approaching still nearer, comes within a mile of it. At this part certainly, it appears very grand to one sailing along the coast near it. The soundings just opposite it agree with what I have stated at the commencement of this description, respecting their being deepest where the land is highest, they are here 150 fathoms two miles off shore. This part of the mountainous tract is called Jibal Fudtheli, the same name as that of the tribe who inhabit it. It extends westwards to within thirty miles of Aden, when behind it is seen a still more magnificent range called Jibal Yaffai, (also inhabited by a tribe of the same name,) which in broken ridges extends to Ras Bab el

Mandab, and here ends the southwestern extremity of the great mountainous tract of this coast.

Between the Yaffai mountains and the sea lies the extensive plain of which Aden forms the southeastern angle. *

COMPARATIVE GEOGRAPHY OF THE SOUTHEAST COAST OF ARABIA.

The foregoing description of the Southeast Coast of Arabia is given from east to west, but the descriptions of the ancient Geographers with which I am about to compare it, have been given from west to east. They are by Ptolemy [1] and Arrian, [2] (or the Author of the Periplus of the Erythræan Sea, who is supposed to have been a navigator or merchant of these parts), and are the only connected descriptions of this coast extant. Both accounts appear to have been written during the first fifty years of the second century of the Christian era and within twenty years of each other,[3] long after Egypt had become a Roman Province, and when the Homerites or Hamyarites occupied the southwestern angle of Arabia, and the Sabeans lived next to them.

Ptolemy's account contains little more than the names of the places on this coast, in his time, in succession, from west to east, with

* In this description I have purposely omitted all geological detail, that I might not distract the readers' attention from the main point, and that I might not introduce here what will be better understood in a separate paper. I have also endeavoured, as much as possible, to avoid repetition of what has already been written of this coast by Captain Haines, the late Captain Wellsted, Lieutenant Cruttenden, the late Dr. Hulton, and myself, preferring rather to refer the reader to these writings, when requisite, than swell out this description by quotations from them.

For the spelling of the *Arabic* words I have taken as my guide that of the inhabitants of the several localities, where I could get any one to write them for me. I am aware that it is incorrect, but it has the advantage of local authority, and can be adjusted by an Arabic scholar. In the English spelling the vowels *a*, *e*, *i*, and *u*, must be pronounced as in Italian.

The information I have given of the interior of of the country, and much of the life and habits of the people on this coast was obtained with as much care and regard to truth, as practicable; that of the coast itself has been described from observation and personal experience.

1 Hudson's 'Geographiæ Veteris Scriptores Græci Minores,' with notes and dissertations by Dodwell, 4 vols. 8vo., 1698—1712. Idem.

3 Dean Vincent, Commerce and Navigation of the Ancients in the Indian Ocean, vol. II. p. 49.

their latitudes and longitudes; whereas the author of the Periplus gives few names but an ample description of both coast and commerce. It will be best therefore to take the description of the Periplus first and endeavour to locate Ptolemy's towns etc. afterwards.

At the second meeting of the Bombay Branch of the Royal Asiatic Society, after it was first established, then called the "Literary Society of Bombay," it was resolved, that prizes should be given annually for the best dissertations on subjects to be proposed by the Society, and the first subject was:—"To illustrate as far as possible from *personal* observation, that part of the Periplus of the Erythræan sea which contains the description of the coast from the Indus to Cape Cormorin."—Whether this was ever done or not I have been unable to discover, at all events it does not appear in the Literary Society's Transactions.

It is therefore not a little gratifying to me to find, when thus far advanced, that I should have been unconsciously labouring in a field of research so near that of the Primitive Members of this Society, as to be endeavouring to illustrate from personal observation, the very next preceding part of the Periplus to that which it was their first object to obtain.

I have already stated that both Ptolemy and the Author of the Periplus have described this coast from west to east, and it will be necessary now, to follow them in that direction, although the description just concluded has been from east to west.

In my comparisons I shall be guided not so much by names and measurements as by the principal physical features of the coast, such as bays, anchorages, promontories, shores, mountains, valleys etc.; for names change and measurements are not always correctly given, but physical features are comparatively indelible. The latter I shall premise before proceeding further.

The two principal bays on this coast are those of El Kamar and Curiyah Muriyah bay, and the small ones and anchorages are those of Aden, Makaten, Ras el' Asidah, Hisn Ghorab, Bander Brum, Makalla, Sharma, Bunder Lask inside Ras Sharwen, the Khor of Khalfot in the bay of El Kamar, Bunders Resut, Marbat, Jinjari, Hasek, and the straits of Masira.

The principal promontories are Ras Sharwen, Ras Fartak, Ras Sajar, and Ras Nus.

The maritime plains are, that lying north of Aden, that between the prominent portion of Jibal Fadtheli and Ras el'Asidah, that between Ras Makalla and Ras Agab a few miles east of Saihut the longest of all, and that of Dofar the most fertile and best irrigated of all.

The mountainous tract, is that which extends from the straits of Bab el Mandab to Ras Nus; it is divided into two portions by the interval of lowland between the Fartak and Fattak ranges in the bay of El Kamar. Then follows the tabular land without mountains from Ras Nus to Ras Jazirah, and from the last named place to the eastern extremity of Arabia the coast is seldom more than 100 feet above the level of the sea

While the chief and only valleys are, Wadi Meifah, Wadi Shikawi, Wadi Masilah, Wadi Shagot and Wadi Rakot.

Rivers there are none, but there are the debouchements of great water-courses in different parts.

The most striking objects on the coast are the Black Basaltic effusions, the natural pillars on Ras Sharwen, the triple or quadruple headed mountain called Jibal Habarid, and Jibal Safan, the twin like mountains which mark the eastern extremity of Arabia.

The principal towns are Howaiyah, Makalla, Shaher, Saihut Kashn, Damkot, Sillalah and Lashkhara.

The Islands consist of three groups, first those opposite Hisn Ghorab, second the Curiyah Muriyah islands in Curiyah Muriyah bay, and third the island of Masira with that of Jazirat Hammar el Nafur.

These are the principal features of the coast, we will now proceed to the comparative geography of it.

Before doing this, however, it is as well to premise that in estimating the distances given by the Author of the Periplus, I shall value the degree at 500 stadia, the number found by Goseilin to answer best for following him through the Red Sea.[1]

Begining then from the straits of Bab el Mandab, we find the first place mentioned by the Author of the Periplus to be *Arabia felix*, which was 1,200 stadia from a port just within the straits called *Okelis*.

1 Recherches sur la Geographie des Anciens. t. viii. p. 9

This *Arabia felix* possessed a commodious harbour and sweeter water than that at *Okelis;* it was the centre of commerce between India and Egypt; whatever business passed between the eastern and western nations took place there, [1] and the inhabitants probably placed what duty they liked on both the Indian and Egyptian goods.

That *Arabia felix* must have been Aden seems determined by its distance from *Okelis* and the description given in the Periplus, simply because there is no other place in the neighbourhood to answer to one or the other. Aden has a commodious harbour and sweet water, and would now be on the chief line of commerce between Asia and Europe, were it not for the discovery of the passages round the Cape of Good Hope and Cape Horn.

If Ptolemy's latitude is to be allowed to have any weight his *Arabiæ emporium* which, as it is the first port mentioned after the straits of Bab el Mandab, so it may be reasonably inferred to be Aden, is the most southern but one of all his latitudes of the south-east coast of Arabia, [2] which is the case with Aden, than which only that part of the coast between Aden and Bab el Mandab is more south. [3]

Hence from the description of *Arabia felix* in the Periplus and the appropriate name by which Ptolemy has designated his most southern port of Arabia, there seems to be very little doubt that both one and the other are the same, and that the port to which they both alluded was Aden.

We have here then a point to start from, and from which the site of *Okelis* should be fixed, rather than Aden from *Okelis*, for there may be doubt about the position of the latter but there cannot be any I think about that of the former.

Proceeding eastward, it is stated in the Periplus, [4] that *Arabia felix* is followed by an oblong shore and gulf, (had this been shore *or* gulf it would have been more intelligible, for certainly, in describing this coast, the author of the Periplus uses the two names *sinus* and *littus* for the most part synonymously.) This shore was more

[1] Ar. Perip. Mar. Eryth. p. 14. loc. cit. [2] Ptolemæi Arabia p. 13. loc cit.

[3] Chart, Capt. Haines. [4] Loc. cit. p. 15.

than 2,000 stadia long; after which came a promontory, and then another port called *Kanè*, situated in the thuriferous region. About 120 stadia from it (*Kanè*) were two desert islands, one called *Orneon* the other *Trallas*, and above it inland was a metropolis called *Sabbatha*. Frankincense was brought to *Kanè* which was grown in the neighbourhood, partly on camels, partly on rafts made of inflated skins and partly in ships. It (*Kanè*) carried on a commerce with Broach (or Gujerath) Oman, Sindh and the neighbouring coast of Persia, also with Egypt. Its exports were the natural produce of the country, frankincense, aloes etc. and such commodities as were found in the other emporia of the coast.

Now, at first, we should say, this *Kanè* must have been Makalla, for Makalla has the very trade at the present day which is here mentioned, with the exception of the more costly articles noted in the Periplus. Vessels from India, Persia, Sindh, Oman, Africa, the Red Sea and from many other parts of the world now frequent Makalla, not so much for the produce of Arabia as for that of the African coast opposite, and Socotra. Makalla is within six days journey of Hadramaut the central province of Arabia, and probably from its reputed fertility the most populous province, and a constant intercourse and small traffic is kept up between the two. Moreover, Makalla has a harbour secure against the N.E. monsoon, a prominent cape extending two miles into the sea on its eastern side, and an abundant supply of fresh water within one mile and a half of the town. There is not another place between it and Aden at all approaching to it in these respects, but then, where are the islands mentioned by the author of the Periplus, there are none; and the distance *Kanè* was from *Arabia felix* prevents our going further eastward to find them. We must look therefore for another locality between Makalla and Aden, and taking the islands for our guide, we find opposite the first group I have mentioned, "a small secure and well sheltered bay and harbour one and a half mile broad by one deep."[1] This is called Bander Hisn Ghorab and is 3° 32′ or 1750 stadia east of Aden. It is the only instance between Aden and Makalla where there is such a bay and where there are any islands. We have then the bay and the islands.

[1] Captain Haines' 1st Memoir.

It is now left for us to ascertain if the locality was favorable for a commercial depot, if there are any remains of this depot, and what was the name of it. That Bunder Hisn Ghorab is a favorable locality for a depot is evident from the harbour being nearly opposite the opening of the great valley called Wadi Meifah, the westernmost of the five great valleys on this coast, which running northward divide the mountainous land into separate tracts and thus afford passages in to the interior. That Bunder Hisn Ghorab and its neighbourhood do present remains of a powerful people is seen by the ruins of the fort called Hisn Ghorab on the west side of the harbour, which contains the longest Hamyaritic incription yet found [1]; and the remains of another fort of the same kind, also containing a Hamyaritic incription,[2] in the valley of Meifah, sixty miles inland from Hisn Ghorab while at Makalla there is no valley nor even break in the mountains opposite it, neither are there any remains of ancient buildings. Indeed so little was thought of Makalla even 700 years ago when Edrisi wrote his Geography, that he does not even mention it by name, stating only that between a place called "Lassa (لسع)" which was west of Makalla and "Choma (شرمة)" which was east of it, "on trouve sur la route un grand bourg auprès de duquel est une source et un *bassin* d'eau chaude ou les habitans font leurs ablutions et transportent leurs malades. Ceux-ci trouvent un remède salutaire contra diverses infirmities." [3] Then as regards the name although we have not literally "*Kanè*" here, we have a name under several forms which comes so near it that we have only to exchange one consonant for another, (one of the commonest interchanges to which the human voice is liable viz. *d* for *n*), to make it radically the same word; this is Khada. We have Ras Khada forming the eastern side of the bay of, or Bunder, Hisn Ghorab, then the Kadhrein islands (two) one mile off it, next the bay of Makadahah, the village of Makadahah, and last of all Ras Makadahah four miles east of Ras Khada. [4] So that we have this name in at least five different forms occurring within as many miles of Bunder Hisn Ghorab.

Now most Geographers have identified *Kanè* with a bay in the old charts hereabouts called Cava Canim, but Dean Vincent states in a

1 Wellsted Travels in Arabia Vol. 1. p. 405. 2 Idem, Vol. II. 421.
3 French Trans. by Jaubert 1846, 4 to. 4 Captain Haines' 1st Memoir.

foot-note,[1] "In Sanson I find the name of Cava Canin first mentioned, where he has a bay and islands; but as Sanson was well acquainted with the Periplus, whether he placed them there out of respect to that authority, or had any other, I cannot discover." Again he says above, but "ifthey exist "that is the islands, they" identify Cava Canim for *Kanè* in preference to Makalla." That Sanson had authority for placing a bay and islands here there can be no doubt, and if the bay were called Cava Canim it still more approached the sound of *Kanè*, than Khada; nor is it impossible that some of the inhabitants may call Khada, Kana, at the present day. Be this as it may, sufficient evidence has been adduced I think, without identification of names, to prove to the most scrupulous investigator that the port called *Kanè* by the author of the Periplus was at Bunder Hisn Ghorab.

As regards the measurements given in the Periplus, taking 500 stadia to the degree, Bunder Hisn Ghorab would be less by 250 from Aden than that mentioned by the author of the Periplus, and Makalla 233 stadia more; while the distance of the islands from *Kanè* is stated to be 120 stadia, about 14 miles; the latter is more than it really is, for if Bunder Hisn Ghorab be *Kanè*, the islands furthest from it are Jibus and Baraghah; the former of which is 41 stadia or 5 miles off shore, and the latter 66 stadia or 8 miles, along shore, east of it.

Again if we take the distance Jibus is from the shore at the distance given in the Periplus, viz. 120 stadia, and apply this rate of measurement to the distance between Aden and Bunder Hisn Ghorab, which are now presumed to have been *Arabia felix* and *Kanè*, we shall find that it amounts to 5,040 stadia which is so out of all probability that we must at once come to the conclusion that for our identification of the places described in the Periplus we must not depend on the measurements, but, as I have before stated, on the indelible features of the coast.

Ptolemy's *Kanè emporium et promontorium* seem merely to want the latter to identify the former with the *Kanè* of the Periplus, and that, we may find in Ras el' Asidah, a black cape, the first conspicuous one after leaving Aden; or in Ras Rättle a conspicuous white cape;

[1] Op. cit. Vol. II. p. 331.

or indeed in Ras Makdahah already mentioned; all of which are within ten miles of Bunder Hisn Ghorab. *Emporium et promontorium* would certainly better suit Makalla and Ras Makalla, as for matter of sequence, but if Ptolemy's latitude may be brought into our assistance his *Kanè* was in a parallel of one degree north of Aden, while Makalla, the only other place with which it could be confounded is in one 105 miles north of it. Bunder Hisn Ghorab is in one 73 miles north of Aden.

Although it seems almost hopeless to attempt to identify any other of the places mentioned by Ptolemy between Aden and Hisn Ghorab, or indeed between the straits of Bab el Mandab and Aden; yet there is such a striking resemblance between names and places which immediately follow *Cana emporium et promontorium*, and names mentioned by Ptolemy himself, in separate parts of his lists, also between these names and names connected with *Kanè* in the Periplus, and between both and names existing at the present day, that it is perhaps worth mentioning.

Thus after *Cana emporium et promontorium* in Ptolemy, come in succession, *Trulla portus*, *Mæphath vicus*, *Prionis flu. ostia*, *Fontes fluvii*, *Embolum vicus*, and *Tretos portus*.[1]

To commence with the resemblance between names mentioned by Ptolemy in different places, we have his *Tretos portus*, and under the head of "Islands," his *Tretæ*, which, if the name of an island or islands, were the next west of his *Insulæ Zenobii*; and as we shall find the latter to have been the Curiyah Muriyah islands, so the former must have been opposite *Kanè* or Bunder Hisn Ghorab. Ptolemy's latitude of *Kanè* and *Trete* are the same in Mercator's and Gosellin's charts, (and the latter placed in Socotra), but not the same in the tables *ap.* Hudson. *Tretos portus* was 1° 35′ north of *Trete*. Then his *Trulla portus*, being close to his *Kanè*, of the same longitude, and within ten minutes of the same latitude, has a great resemblance to the island called *Trullas* by the author of the Periplus, which was one of the two opposite *Kanè* or Bunder Hisn Ghorab. While Ptolemy's *Mæphath vicus* is very nearly allied in name to Meifah, the valley of

[1] Loc. cit. p, 13.

Meifah and village of the same name in it [1] at the present day, opposite Bunder Hisn Ghorab. And the mention of a river here, which if any exist in this part of Arabia for a period, might be fairly expected to issue from some great valley, would therefore be in Wadi Meifah, for there is no other great valley here. This is supported by Captain Wellsted's account, who states of a part of this valley, "it is about one mile and a half in width, and the bank on either side with the ground over which we [Wellsted and Cruttenden] were passing, afforded abundant evidence of its having been the bed of a powerful stream but a short time previous." [2]

Of the oblong shore and bay, *littus oblongum et sinus*, mentioned in the Periplus, between *Arabia felix* and *Kanè*, (Aden and Bunder Hisn Ghorab), I can say nothing more, than that there is no bay there of this extent, and there is nothing in the shore that I could see to merit the designation applied to it by the author of the Periplus; but probably if I rightly understood the meaning of his terms I should have seen both. Neither can I make out Ptolemy's *Magnum* and *Parvum littus* here a bit more satisfactorily. There is a great maritime plain behind Aden, which is divided from a lesser one to the eastward extending to Ras l'Assidah, by the projecting part of the Fudtheli mountains, but beyond this there seems to be nothing to identify with Ptolemy's great and little shore.

The metropolis called *Sabbatha*, stated in the Periplus to be above *Kanè*, I shall have to notice hereafter.

Following *Kanè*, the author of the Periplus continues:— *Post Canam magno spatio terra retrocedente, alius profundissimus sinus sequitur longo tractu extensus, qui Sachalites nuncupatur: et regio thurifera, montana, adituque difficiles, * * * Atque hujus quidem sinus maximum est mundi promontorium ad orientem spectans, Syagros appellatum: in quo regionis illius castrum est, et portus, thurisque collecti receptaculum.*[3] We have therefore to follow the coast eastward to the first remarkable promontory, for we have no measurement here, and see if this answers to the description given in the Periplus.

1 Willsted's Trav. in Arab. Vol. 1. p. 426 "Sketch of Route to Ruins of Nakab el Hajar."

2 Idem. 3 Loc. cit. pp, 16, 17.

Leaving Bunder Hisn Ghorab then, we pass successively Ras Makallah, Ras Bu Gashwa, Ras Sherwen, and then come to Ras Fartak, which though not exactly answering to the description of the author of the Periplus in being the largest in the world, for Ras Sajar the next cape to it is larger, yet from its prominence, its size, and its position, it is by far the most remarkable on this coast. To give some idea of its prominence, I may again state that, it is the isolated extremity of a narrow mountainous ridge 2,500 feet high and four or five miles broad at its base, having the bay of El Kamar on one side and an extensive plain on the other; scarped 1,900 feet perpendicularly to the water's edge on the eastern side, and sloping rapidly on the western side, while the turn of the coast gives its extremity an E.S.E. aspect, and not the ridge, which runs north by west. Thus far it answers to the description of the Periplus. As for the rest, the coast-line begins to recede suddenly from Ras Kelb, twenty miles east of Bunder Hisn Ghorab, and continues to do so for thirty miles further on, to Ras Makalla; but from thence it is almost straight to the neighbourhood of Ras Fartak. It is indeed the straightest part of this coast, and is accompanied by the mountainous tract of Southern Arabia, almost uninterruptedly, the whole way. The latter is confronted by a comparatively low mountaninous shore from Bunder Hisn Ghorab to Ras Makalla, (the tract of igneous rocks already mentioned,) and afterwards, by an almost uninterrupted strip of plain or *sahil* to Ras Agab, a distance of 140 miles, when the mountainous tract advances upon the sea again, and the coast becomes more or less scarped and mountainous to Ras Sharwen, and then mountainous at intervals, to Ras Fartak.

The mountains are steep and difficult of access, and they yield frankincense, for this tree grows on them from above Makalla eastwards, and probably more or less throughout the whole mountainous tract to Jibal Yaffai behind Aden; for it abounds on the limestone mountains of the Somali coast opposite, which is probably part of the same formation.

We have then an immense cape, with its extremity directed more towards east than south, (though not due east,) which is quite sufficient for our purpose; mountains steep and difficult of access, and yielding frankincense; and the shore receding, but not continuously to

form a great gulf or bay, as the author of the Periplus would seem to have it, any more than we have found a similar continuous *sinus*, or bay, between Aden and Bunder Hisn Ghorab. Thus we have nearly all the features mentioned in the Periplus between *Kanè* and *Syagros*. Let us now see what further confirmation the bay of *Sachalites* so far identified, derives from the testimony of Ptolemy.

In locating the different nations of southern Arabia, this Geographer states, *Sub his autem omnibus Chatrammitæ, à Climace usque Sachalitas.*[1] Now we know that his *Climax mons* was in the S.W. angle of Arabia, and moreover, we know the position of his *Chatrammitæ*, insomuch as they were the people of Hadramaut, which province is six days inland from Makalla, ten days from Kashn, and about fifteen days from El Ghraitha, a town in the bay of El Kamar. Thus it must have been north of Makalla, extending some distance eastward towards El Ghraitha. It would then be behind the mountainous land and coast which we have supposed to border on the bay of *Sachalites* of the Periplus; and so far further, the position we have given this bay, would appear to derive additional confirmation from Ptolemy's testimony. It may be said that Ptolemy places his *Sinus sachalites* after Fartak, or *Syagros*, which is the case, but we shall see by and by that the author of the Periplus has one there too; and it is much more probable if we be right in the position of Ptolemy's *Chatrammitæ*, that Ptolemy or his informants omitted to mention a *sinus sachalites* here, than that the author of the Periplus put in one too many. Again we shall presently see from the probable etymology of the word *Sachalites*, that its application was more general than specific on this coast, which may still further account for Ptolemy's apparent omission.

The term *Sachalites* appears to be derived from the Arabic word *sahil*, ساحل, for in divesting the former of its Greek termination we have remaining *sachal*, which is *sahal*; since *ch*, not only with the Greeks and Romans, but with many nations at the present day, has been, and is now, substituted for the Arabic ح, *hha*, which from its guttaral sound is pronounced like *ch*, e. g. Achmed for Ahmed, احمد!; Χατραμωτῖται (Ptolemy) and Chatramotitæ (Pliny) from حضرموت, (Abulfeda). Hence we have in *sachal* the equivalent radicles

[1] Loc. cit. p. 21.

of ساحل, which as I have frequently stated means maritime plain,and the people who inhabit the *sahil* are called by the Arabs the *ahl el sahil*, or sahilites. Gossellin (Vol. iii. p. 16. Op. cit.) has given this derivation to the word *Sachalites*, but the probability of it struck me before I saw it mentioned by this author; while if there be any part of this coast which deserves the name of *sahil* from its extent, more than another, it is the tract between Ras Makalla and Ras Agab. It is remarkable too, that we should have the port on this *sahil* to the great Wadi Masilah, called Saihut, which in some parts is called Sahul, and by the slightest permutation would make Sahil; while we have in Ptolemy's list of cities and towns in Southern Arabia, *Maccala* and *Sachle*, following next each other, from east to west, and the former twenty-five minutes north of the latter, which is as it should be, if they were meant for Masilah and Saihut.

On the shores of the Red Sea, Tahāma is the name applied to the maritime plain; on the south eastern coast of Arabia, it is called Sāhil, while on the coast of Oman, the flat country north of Maskat is called Bātanah; but whether the latter be the common term for maritime plain here I know not; hardly any but that called Bātanah, exists, on the latter coast.

As for the derivation of *Syagros*, we have the same name for the first promontory after *Kanè*, both in Ptolemy and the author of the Periplus; but there is no resemblance in name between *Syagros* and Fartak. We have, however, a village on the shore within a few miles of Ras Fartak, called Sagar, صقر, which has the same radical letters in it as *Syagros*, when the latter is divested of its Greek termination, and in the name of this village therefore, would seem to linger a trace of the name formerly applied to the cape close to it.

To identify Ptolemy's *Syagros extrema*, with the *Syagros* of the Periplus, and the Ras Fartak of the present day, hardly anything more can be said than that as the next cape to *Kanè* in the Periplus is *Syagros*, so it is the next in Ptolemy.

After the places mentioned by Ptolemy, which would seem to have been about Bunder Hisn Ghorab, come *Thiallelah vicus*, then *Moscha portus*, and lastly *Syagros extrema*, which last was the eastern extremity of Ptolemy's *Regio Adramitarum*, or Hadramaut. As in

the Periplus, so in Ptolemy, we shall find a *Sinus Sachalites* coming after *Syagros extrema*, and from this being the estern limit of his region of Hadramaut, so the *Sachalites* which he places south of Hadramaut, (*Chatrammitæ, à Climace usque Sachalitas,*) seems to have been in front of it, and to have been the *Sachalites* mentioned by the author of the Periplus, and omitted here as before stated by Ptolemy. All this, without measurement, would seem to identify Ptolemy's *Syagros* with the *Syagros* of the Periplus, and the Fartak of the present day. If we may be allowed to quote Ptolemy's latitude without longitude in this case, his *Syagros extrema*, was in a parallel of 2° 30′ north of Aden, which is only twenty two minutes less than in should be; and if we were to carry on his *Syagros* even to the next cape east of it, viz. Ras Sajar, we should find it 1° 6′ still further south than it should be, for Ras Sajar is this distance north of Fartak.

The castle and port which served as a *receptaculum* of frankincense, mentioned by the author of the Periplus, at, or in the neighbourhood of, *Syagros*, might have been the port of Kashn, which is the chief town of the great Mahrah Tribe, on the coast; there is a bay there, the bay of Kashn, and a little Bunder opposite, called Lask, which is protected by Ras Sharwen from the southeast monsoon. The Shaykh of the Mahrah lives at Kashn. This might have been the situation too of Ptolemy's *Moscha portus*, which just precedes his *Syagros*. The bay, though not so capacious as, is something similar to, the bay of Resut, in which we shall find by and by, another incense port, called *Moscha*, by the author of the Periplus.[1]

Next to *Syagros*, the island of Socotra and its produce is mentioned by the author of the Periplus, under the name of *Insula Dioscoridis;* but as I know nothing of this island personally, and it is rather on the coast of Africa than Arabia, though subject to the latter, (as noticed in the Periplus,) having been under the Shaykh of the Mahrah from time immemorial, I shall say nothing more of it here, than that the author of the Periplus is as accurate in his information

1 Could *Moscha*, have come from ساق, *Mercatui operam dedit, emit venditque.* Gol. There is a place called *Suk* سوق, *close* to Kashn, also Suk el Hasek, and Suk el Basir, on this coast.

respecting this island as in any part of his description of the coast of Arabia. It is worth noticing however that it was under that Eleazus who was king of the Frankincense Region *in Arabia*, and not under Charibael, who ruled over *that* of Azania or the Somali coast. This, with the fact, that even to this day it belongs to the Mahrah Tribe, whose Shaykh as before stated lives at Kashn, the only port of the Mahrah, for they have no other with a bay, seems to point out Kashn as the incense port of the Periplus and the *Moscha portus* of Ptolemy.

Proceeding eastwards, the author of the Periplus states:—"*Syagrum proxime attingit sinus, versus continentem, Omana, valde profundus; cujus transitus stadia sexcento* (600) *patet. Post eum stadiorum quingentorum* (500) *spatio montes sunt alti, petrosi, prærupti, hominum in speluncis habitantium. Deinceps sequitur portus nobilis aptus ad thus Sachaliticum convehendum, qui Moscha portus dicitur. In hunc à Cana naves quædam mitti solent; quæque Limyrica aut Barygazis veniunt eo deferuntur, sero anni tempore hyemen ibi traducentes, à regiis ministris thus recipiunt et exportant, cum quibus othonium, frumentum, atque oleum commutant.*" (p. 18, Loc. cit.)

The first thing that strikes us here is the identity of the bay of El Kamar with the deep gulf adjoining *Syagros*, and the least intelligible that it should be connected with Oman. But we know that Ptolemy's *Regio Adramitarum* ended at *Syagros*, and we know also, from the interval of low land, forty miles in breadth which exists in the bay of El Kamar, between the Fartak and Fattak ranges, that there is a natural separation here of the mountainous tracts of the southeast coast of Arabia; the one extending from Bab el Mandab eastwards to terminate at Ras Fartak, and the other continuing on from Fattak to terminate at Ras Nus. Therefore it is not extraordinary that the latter should meet with a new appellation from the author of the Periplus, but why it should be named *Omana*, or Oman, is difficult to understand, when that country at the present day is disjoined from the mountainous tract last mentioned, by the intervention of the *regio barbara* of the Periplus, or great desert of Akaf, upwards of 250 miles wide, which is even a greater separation than if the sea itself had existed between these two parts of Arabia. But of this hereafter; let us deal with the physical features of this part first.

That there is in reality a *sinus*, or gulf, next to Fartak, and that too running very deep into the mainland, (*valde profundus,*) viz. the bay of El Kamar, the deepest on this coast, of which Ras Fartak is the south western extremity, is undeniable; but that its *transitus*, is only 600 stadia, unless we take it from Ras Fartak to Wadi Shagot where the low shore first meets the mountainous tract of Fattak, is not correct. For the real *transitus* of this bay, that which a coasting vessel would make it, is about 850 stadia, that is the distance, allowing 500 stadia to the degree, between Ras Fartak and Ras Sajar, the next prominent cape. But that the former, and not the latter, was the *transitus* of the author of the Periplus seems plain, for after giving us his measurement of it, he immediately commences with a second measurement of 500 stadia, without saying anything of the coast along the first measurement, which agrees with what I have stated, viz. that there is a low barren tract here without any remarkable feature on it, and apparently uninhabited; but, where at the end of his 600 stadia the lowland terminates, and, with the commencement of his next measurement the highland begins, there he observes are mountains, high, rocky, precipitous, with men living in caves.

I have already stated that the lowland in the bay of El Kamar meets the mountainous tract on the northern side at Wadi Shagot, and that here the mountains are high, and rocky, being composed of hard limestone, also that they are precipitous, and that the lights in them at night as well as what we saw by day, shewed that there are many caverns in them which are inhabited. Moreover, as stated in the preceding geographical description, this is the commencement, coming from the west, of the wooded region of this coast. Here it is that the frankincense tree is first met with in abundance, and from henceforward to the end of this mountainous tract, at Hasek, every village on the coast exports large quantities of frankincense, which is just the contrary as we proceed in the opposite direction; not so much perhaps from the greater scarcity of the tree, as on account of the large importations of frankincense at Makalla from the opposite shore of Africa. After these high mountains, etc. and the end of the 500 stadia, comes the Author's *portus nobilis*, which he calls *Moscha*.

And it would be difficult to determine where this port had been situated, were it not for the following context viz. " that vessels coasting along from Malabar or Broach (Canara or Cambay) at advanced seasons, put in here for the winter, where they took in frankincense in exchange for muslins, corn, and oil."

Now had there been any bay on this part of the coast where vessels could stay during the winter, or S.W. monsoon, besides that of Resut, which I have before stated to be sufficiently large and deep to shelter vessels of three or four hundred tons burden during that tempestuous season, there would have been a difficulty in saying where the *Moscha* of the Periplus was, but now there is none. There is no other bay of the kind in this neighbourhood, and none on the whole of this coast, so capacious, for sheltering vessels during the S.W. monsoon. There is another bay at the eastern extremity of Dofar, viz. at' Marbat, but this only affords shelter during the N.E. monsoon and is open to the S.W. monsoon. There therefore can be no hesitation in identifying the bay mentioned by the author of the Periplus with Bunder Resut and placing his *Moscha portus* here. I have already said that there are the remains of a place or fort on the extremity of Ras Resut, and that a short distance from it, there is an ancient Burial-Ground of two or three acres in extent, which remains shew that this locality was once inhabited, although there is not a human habitation now within several miles of it. But places of this kind in Arabia and Africa do not want human dwellings to give them a name. If *Moscha* be derived from *suk* as before mentioned (p. 298 foot-note,) there might have been a *suk* or *forum* here, where the mountain tribes assembled to barter the produce of the country with ships which anchored in the bay for that purpose. At Berbera on the African coast, opposite Aden, there are twenty thousand people at the bartering season and at other times not a soul. [1] Fresh water there is, in plenty, close by Resut, and the frankincense and moql trees, the one yielding frankincense the other bdellium, grow in countless numbers within a

[1] Lieutenant Cruttenden, Transactions Bombay Geographical Society, April to September 1849 p. 187.

few hours walk of the bay. The former is so abundant and so cheap here that when I asked the shaykh of Aukadh, the next village to Bunder Resut, for a specimen of the frankincense which grew in the neighbourhood, he sent me nearly a hundred weight of it, and when I took a few portions and gave the people who brought it the rest, they considered it of so little value that they would not be at the trouble of taking it away with them. Thus we see that the bay of Resut is in the heart of the Frankincense Region. [1]

It is most probable that the vessels which put into the bay of Resut under such circumstances as those mentioned in the Periplus, took the frankincense which they got in exchange for their muslins, corn and oil, on to *Kanè* or *Arabia emporium*, to transfer to the Sabeans at *Kanè* (Bunder Hisn Ghorab.) or to exchange with the Egyptians in the bay of Aden. For in India a species of the frankincense tree abounds, which yields a plentiful supply of the same kind of resinous gum as that of Arabia, and therefore would not be required here.

We have then I think identified the gulf adjoining *Syagros* with that alluded to by the author of the Periplus; his *transitus* of 600 stadia; the rocky mountains on the coast with inhabited caves. His distance of 500 stadia more, would not bring us to within 20 miles of Resut, computing 500 stadia to the degree, but then the defective measurement here, is compensated for, by the presence of only one bay in this neighbourhood which answers to the description in the Periplus, and the port called *Moscha* must therefore be fixed here.

Here also we have the name of *Sachalites* again, (*thus Sachaliticum*,) as if there were a *Sachalites* also here; for we cannot suppose that the small quantity of frankincense produced from the mountains between Bunder Hisn Ghorab and Fartak was imported at a bay in the *heart* of the Frankincense country; so that, this sachalitic frankincense must have been brought from the shores of Dofar, if *sahil* be synonymous with *sachalites*; for no name is given by the author of the Periplus to the *sinus* adjoining Fartak on the east (which is the bay of El Kamar,) neither is there any *sahil* there to call

[1] For a description of the Frankincense Region of Arabia, see No. xi of this Journal.

for the term "*Sachalites.*" Again Ptolemy's *Sinus Sachalites* which he mentions immediately after *Syagros extrema*, extended to Ras el Had, or further still perhaps; for from *Syagros* eastwards, he includes every thing under the head of *Sinus Sachalites*, even to the straits of the Persian Gulf.

Let us now return to Ptolemy's *Syagros*, or Fartak, and its neighbourhood, and although it seems hopeless to attempt to identify any of the places mentioned by him with those now existing between Ras Fartak and Resut, see, if it be possible to establish the line of demarcation between his *Regio Myrrhifera exterior* and *Libanotophoros sive Thurifera.*

Ptolemy states:—*Quibus versus orientem juxta Chatramititas quidem, est exterior Myrrhifera*, and then immediately after, *Juxta autem Syagrum montem usque mare Ascitæ sunt.* Now the fact of our having ascertained that Hadramaut lies inland, west of the bay of El Kamar and that of Ptolemy's having placed on its eastern side the *Regio Myrrhifera exterior*, together with the mention of *Syagrum montem*, seems to require no further evidence to convince us that we have come to the termination of the latter at Ras Fartak, and the commencement of his *Libanotophoros* in the mountains of Fattak.

Ptolemy also states in enumerating the principal tribes and mountains:— *et Omanitæ, quibus orientaliores sunt Cattabeni usque montes Assaborum. Sub quibus Libanotophoros sive Thurifera.* Here there is a striking identity of names between Ptolemy's *Omanitæ*, and the name of *Omana* given in Periplus to the coast immediately after *Syagros*, particularly as the position of the former is so well marked by the *Cattabeni* being placed immediately after the *Omanitæ*, to the eastward; and under the *Cattabeni*, the Libanotophorous Region. I have already stated that there are two localities in which the frankincense tree abounds at Dofar, one on the mountains, the other on the maritime plain. [1]

If then through the conjoint aid of Ptolemy and the author of the Periplus we are able to fix the commencement of the Libanotophorous

1 Descrip. of Frankincense Tree. loc. cit.

or Frankincense Region, by establishing the limit of the *Regio Myrrhifera exterior*, then we shall also be able to judge where the town of *Sabbatha* before mentioned, was situated; since this place was according to Pliny,[1] eight days distance from the Frankincense Region; and if through this measurement we can find out the neighbourhood of *Sabbatha* we may still further be able to establish the position of *Kanè*. Supposing we measure these eight day's journey westward, or S.W. from Wadi Shagot, or the Fattak range, at between thirty and forty miles a day, *Sabbatha* would be found about Wadi Meifah, which if we have rightly fixed *Kanè*, should be its situation; but unfortunately these journeys are too great, at the same time, Wadi Shagot is at the eastern termination of the Fattak range, which, running inland southwestward, may prolong this mountainous tract, (on which the frankincense tree abounds in the bay of El Kamar,) for some distance westward, and thus bring it nearer *Sabbatha*, which would of course shorten the day's journey.

After *Syagros extrema*, Ptolemy places his *Sinus Sachalites. Sachalitarum in sinu Sachalite, in quo Colymbesis Pinici; super utribus transnavigant;* under which heading comes a number of places to which I shall have occasion to refer by and by.

Continuing on with the author of the Periplus from Ras Resut, we find that he states:—*Hinc rursus stadiorum circiter mille et quingentorum* (1,500) *spatio regio illa usque ad Asichonem, ad terram usque extenditur, cujus in extrema ora septem* (7) *insulæ ex ordine jacent, Zenobii dictæ; post quas alia regio barbara, quæ non ad idem regnum sed ad Persidem pertinet.*

Here the measurement is very incorrect, inasmuch as are there only 750 stadia (1° 30′) at most between Resut and Hasek, which from the presence of "the islands" and its name, is unquestionably the *Asichon* of the Periplus; not less so than the bay of Resut is the site of his *Moscha portus*, because there is no other bay of the kind on this part of the coast.

The islands called *Zenobii insulæ* are the Curiyah Muriyah islands, the second group on this coast coming from the west; and the *regio*

1 Lib. xii c. xiv. "*Octo mansionibus.*"

barbara, is the comparatively low, desert-land, which follows the abrupt termination of the Negdi or mountainous tract called Jibal Sabhan. It would be difficult to make out seven islands here, unless we counted some groups of rocks which are uncovered at low water, but there are five real ones, which is near enough, viz. Haski, Soda, Hallani, Jibliyah, and Gharzaut.

This brings us to the eastern extremity of the Frankincense Region, and before proceeding further with the author of the Periplus, let us see if there be any thing in Ptolemy which can be identified between Ras Fartak and Hasek. I have already stated that it seems hopeless to attempt this in the bay of El Kamar.

After *Syagros extrema*, Ptolemy continues as before stated. *Sachalitarum in sinu Sachalites, in quo Colymbesis Pinici; super utribus transnavigant*, under which heading are, *Cumacatum (Pal. Cumetacum) vicus, Ausara civitas, Astoa vicus, Ange vicus, Neogiala (Pal. Neogilla) navale, Hormani flu. ostia, Didymi montes, Bosara (Pal. Conseude) civitas, Vaticinum sive oraculum Dianæ, Abisa (Pal. Abissagi) civitas. Corodanum promont. Et in Angustiis sinus Persici: Crytus portus, Melanes montes Assaborum dicti*, and *Assaborum promontorium.*

This *Sinus Sachalites* of Ptolemy would seem to extend to the straits of the Persian Gulf, which is unintelligible, unless a different meaning is given to "*sinus;*" how far this can be done I leave others to decide. In another place Ptolemy states, *Juxta autem Syagrum montem usque ad mare Ascitæ sunt.* These *Ascitæ* were most likely his *Colymbesis Pinici*, pearl-divers, who sailed about his *Sinus Sachalites* on inflated skins (ασκος) and if we are to extend his *sinus* to Ras el Had, we shall find that east of Hasek, the use of inflated skins, as before stated, is not only common but from the great poverty of the country and people, almost wholly supplies the place of boats at the present day. The next place to *Syagros* is *Cumacatum vicus* a "place", this might have been Damkot; than follows a city called *Ausara.** Now

* NOTE.—Pliny mentions *Ausaritis* as one of the kinds of Myrrh, (lb. xii. c. xvi.) but this came from the *Gebanites* whom he places at the straits of Bab el Mandab. Salmasius states that Pliny followed Strabo, who writes, first came the *Minæi*, then the *Sabæi*,

as there is nothing in the bay of El Kamar to induce one to think

then the *Catabanes* to the straits of the Red Sea, and east of all the *Chatramotitæ* (lib. xvi. p. 768;) while Ptolemy states, that the *Catabeni* lived next the Frankincense Region, which was east of the *Myrrhifera exterior*, and therefore east of the *Chatramotitæ*, whose region extended to his *Sinus Sachalites*, which was again east of *Syagros*; and Strabo afterwards adds, *Catabanum thus gignit, myrrham vero Chatramotitæ*, Catabania produces frankincense, Chatramotites myrrh. Yet the Frankincense Region and the straits of Bal el Mandab are hundreds of miles apart; how then could the *Gebanites* be neighbours of the *Catabeni*. Let us see how far the probable origin of the name *Gebanites* will help us out of these difficulties. *Breve*, the *Gebanites* as before stated, according to Pliny, inhabited that part of Arabia next the straits of Bab el Mandab, their port was *Okelis* (Plin lib: xii. c. xix.) just inside the straits, the *Okelis* of the Periplus, and Pliny states "*De Thure*" "*evehi (thus) non potest, nisi per Gebanitas; itaque et horum regi penditur vectigal.*" Hence the *Gebanites* were the inhabitants of the mountainous part of the S.W. angle of Arabia, and they would not allow any frankincense to be passed through their country without toll. Salmasius writes, (p. 351.) "*Gebalitæ ab oppido Gebala. Stephanus* Γεβαλα *vocat. Alii* Γεβανα. *Nam Græci* λ *et* ν in *multis confundunt.*" Now the latter was probably the proper spelling, inasmuch as the "Gebala" appear to have been no other than the Kabayle or mountaineers of Southern Arabia at the present day. The Arabs at Aden, call the inhabitants of Jibal Yaffai, or the mountains inland of them, the Kabayle; and if you ask at Makalla, who inhabit the mountainous region between that town, and the province of Hadramaut, the answer again is "the Kabayle." It would seem therefore to follow, that the *Gebanites* inhabited under the same name, as they do now, the mountainous tract between the straits of Bab el Mandab and Ras Fartak, where it is evident the *Catabeni*, whom Ptolemy places next the Frankincense Region, might have been their neighbours without living near the straits. Ausara might have been one of there chief cities, and the kind of myrrh mentioned by Pliny, called "Ausaritis" after it. Pliny, who in his geographical description comes round from the eastward, places the *Catabeni* first, "*Gentes Larendani, Catabeni, Gebanitæ, etc.*" (lib. vi. c. viii.) Hence it would also appear that Strabo's *Catabanes*, who extended to the straits of Bab el Mandab, ought to have been called *Gebanites*, unless, as some have thought, the terms were synonymous, (Salmasius, T. I. p. 351. D.) Could the kind of myrrh called *Ausaritis* by Pliny have grown near to, and have been called after, Ptolemy's city of *Ausara*, and like the frankincense which grew in *Catabania* have been passed through the hands of the *Gebanites*; and could the *Catabeni* have been a tribe of the Kabayle, or *Gebanites*, and that tribe the Bin Kahtan or Beni Kahtan, the head family of the Karah, who inhabit that part of the mountainous tract called Sabhan and Shaher, at the present day? The Frankincense Region of Arabia. Bochart supposes the *Catabeni* and *Gebanites* to be the same people (Dean Vincent p. 339, foot-note). It is perhaps worthy of remark also, that among Ptolemy's cities and towns of Southern Arabia, there is another place called *Ausara*, which was in 25° 30′ N., that is within 40 miles of the latitude of Ras Massandan, which was the eastern extremity of Ptolemy's *Libanotophoros* or Frankincense Region.

there could ever have been a city there, and there is every appearance of it in the district of Dofar, *Ausara* might, therefore, have been the name of the principal place in the latter. I have already alluded to the extensive ruins of an old city in Dofar now called El Balad. Next come two places, *Ange* and *Astoa*, which might have been Marbat and Hasek; but it is useless to write one's conjectures in this respect, let us go on to Ptolemy's *Melanes montes et promontorium Assaborum*, which were the eastern termination of his Libanotophorous or Thuriferous Region, and which we find forming the western promonotory of the straits of the Persian Gulf, nine degrees north of, or 540 miles distant from where if really is, with an immense desert between the two points more than equal to so much sea, as a barrier of separation. That this is a mistake there can be no doubt; but there is still the question whether the Libanotophorous Region alone has been misplaced, or whether the *montes et promontorium Assaborum* have not been transported to the straits of the Persian Gulf with it. Be the latter as it may, the termination eastward of the frankincense country of Arabia is called Jibal Sabhan; and the terminating cape though called Ras Nus, has within six miles of it, two capes, called respectively, Ras Samhor and Ras Samhal; and between them again, a valley called Wadi Samhal; in which names we have but to exchange the *r* and *l* respectively for *n*, and the *b* in both for *m*, to have Sabhan; the commonest permutations to which the human voice is liable, and which the wild inhabitants of this part of the coast, from whom Captain Haines must have obtained these names, would be likely to fall into, and persist in according to the custom of the day, or the natural development of their organs of voice, which might favor one kind of sound more than another. We have a remarkable instance of this permutation in point. This very Ras Nus here, is called by Edrisi, Ras Lus, لوس. In these names then of Jibal Sabhan, and Ras Sabhan we seem to have *montes et promontorium Assaborum*, and that too at the end of the Libanotophorous Region; for as D'Anville states, the *Assaborum* is nothing more than *Sabo*, which with the Arabic article is pronounced *As-Sabo*. As to the *m* in Samhor, and Samhal, the inhabitants of Marbat *close by*, called the mountainous tract above them at one

time, Samhan and at another Saban or Sabhan. Lieutenant Cruttenden writes it "Subahn;"[1] the aspiration is as immaterial as the rest. Almost every thing therefore inclines one to the belief that the root of the word is "Saba", from which both the Greek and Arabic appellations have been derived. There is another coincidence here, which seems to assist in accounting for the misplacement of this region viz. the Frankincense Region appears to have gone by the name of *Omana*, for the author of the Periplus, as I have before stated, makes his gulf after Fartak, or *Syagros*, extend into the land of *Omana*, and then at the end of the Frankincense Region observes, after the Zenobian Islands comes the *regio barbara*, which belonged to Persia; while Ptolemy writes, *et Omanitæ*, (who from their position and name must have been the inhabitants of the *Omana* of the Periplus next to Syagros,) *quibus orientaliores sunt Cattabeni usque montes Assaborum. Sub quibus Libanotophoros sive Thurifera.* Can it be that this *regio barbara* did belong to Persia, and that the country west of it was called Oman, and that this has led to the mistake of placing the eastern extremity of the Frankincense Region at the northernmost extremity of the Oman of the present day, which is the western promontory of the straits of the Persian Gulf, called in the *Paraplus Nearchi*[1], the promontory of Maceta; adjoining which too Ptolemy's *Macæ* lived; and which was probably for centuries back called Mazun, by the Arabs, (المزون *terra Oman*, Gieuharis ap. Golius); and is the cape Massandan of the present day. Yet the author of the Periplus calls this *Sabo*, but then it is questionable if he does this on his own authority.

We come now to the description of the coast from Hasek to Ras el Had, and returning to the Periplus we find it stated:—*Hanc ubi ex supernis locis prætervectus fueris circiter duo millia* (2,000) *stadiorum à Zenobii insulis, alia occurrit insula Sarapidis nuncupata, quæ à terra circiter stadia centum et viginti* (120) *abest, latitudine fere stadiorum ducentorum* (200.)

This, is both exceedingly graphic and correct in measurement. "When we shall have sailed from these high places" (meaning the

1 Trans. Geograp. Soc. Bombay, January 1837. p. 71.
. Geog. Min. Græc. ap. Hudson p. 22.

Subhan heights (of 4,000 feet over Hasek,) and passed along the comparatively low *regio barbara* (of 800 feet), of which the author states nothing, because there literally is nothing to notice,) 2,000 stadia from the Zenobian Islands, there is another island, called *Sarapis;* the length, breadth and distance of which from the shore, so corresponds with that of Masira, that had this not been his next island to the *Zenobii insulæ,* and had nothing more of it been stated in the Periplus, the measurements rated at 500 stadia the degree would have been sufficient for its identification.

In this island the author states there were three places, inhabited by Priests of the Icthyophagi; by which we infer that the inhabitants of Masira and its neighbourhood were Icthyophagi. He also states that boats and vessels came to *Sarapis* from *Kanè* for turtle-shell, and that this was abundant there, and of excellent quality. With the exception of the Priests, this would do for the description of Masira at the present day. I have already stated that its inhabitants as well as the people on the coast opposite, subsist almost entirely on fish, also that it is famous for turtle-shell, and that the channel between Masira and the mainland may be said to swarm with turtle. For two or three shillings, the people of this island will bring a turtle weighing upwards of 260 lbs. and that too at a few hours notice. They go forth, after the order is given, to the place where the turtle most abound, and while the latter consider themselves secure below the shallow water, a loose barbed spike at the end of a long bamboo, to which is attached a rope, is struck into their back, and they are thus pulled on board, with almost as little ceremony as a rock.

Another thing is worth mentioning here. The author of the Periplus states, that in Masira, the inhabitants speak Arabic, which would seem as if hitherto they had not done so. And when we remember that the inhabitants of the Curiyah Muriyah islands, the Karah on the coast opposite, and the Mahrah, all speak the same dialect and one differing very much from common Arabic, we seem to come at the meaning of the remark.

Proceeding eastwards from *Sarapis*, or Masira, the author of the Periplus continues :—*In sinu autem vicinæ continentis, ad Septentriones,*

prope ostium maris Persici, insulæ jacent ad quas navigatur, Calæi insulæ dictæ, quæ fere bis mille stadiorum intervallo à continente sunt disjunctæ; which, as there is no bay between Masira and the turning point, viz. Ras el Khabba, but a nearly straight coast, is better rendered by Dean Vincent thus:—" [Proceeding on your course from Sarapis,] you wind round with the adjoining coast to the north; and as you approach towards the entrace of the gulf of Persia at the distance of about 200 stadia [from *Sarapis*] you pass a group of islands which lie in a *range* along the coast and are called the islands of of Kalaius." Περικολπίζω, is *to sail round a bay,* and as I have before said we must not always give the real meaning to κολπος, in verifying the descriptions of the author of this Periplus on the coast or we might as well give up the attempt at once. The literal meaning of περικολπίζοντι here, as Dean Vincent observes, is " to follow the windings of the shore," hence we have "winding round the coast to the north," which is as it should be, for in following the coast northeastward from Masira we must wind round it at Ras El Khabba, and that too towards the north.

We have no mention in the Periplus of Ras El Had, because as I have before said, it is a sandy plain forming the northern angle of the east extremity of Arabia, which extremity is not attenuated as those may think who view it in small maps, but truncated, and has an eastern aspect of twenty miles in extent, the southern cape or angle of which is Ras el Khabha and the northern, Ras el Had. Here therefore, as there is nothing remarkable but the presence of the two mountains called Jibal Saffan, we do not wonder at the author's silence. Yet his Commentators would have had it believed that he has overlooked the magnitude of Ras el Had; and in such observations, we see how necessary it is to be really, and not imaginarily acquainted with a subject, before we attempt to establish the truth of parts of it, upon the criticism of others. Dean Vincent remarks, on the description of *Syagros,* or Fartak, in the Periplus " it is not true" as the author of the Periplus states " that it (Fartak) is the largest promontory in the world; for Ras el Had, on the same coast is larger."

Again Gosellin, describing the bay of El Kamar, states from El Edrisi: "Les Arabes appellent aussi ce rivage *Ghobb Al Camar*, la cote de la lune puisqu'il est entourie, a quelque distance par un chaîn de montagnes semicirculaire qu'ils sont comparée au croissant et qu'ils ont nommè la montagne de la lune" [1]. We have seen the absurdity of the former, and nothing can be more absurd than the latter. Had el Edrisi or Gosellin ever been on the spot, they would have seen that the western shore of the bay of El Kamar is hardly 100 feet above the level of the sea, that it is forty miles broad, and that this tract of lowland extends westward between the Fartak and Fattak ranges, as far as the horizon without being bounded by any mountains; and that the mountainous tract continued on from Fattak to Ras Sajar does not fall back, or present any maritime plain in front of it until arriving at the district of Dofar. I particularly looked for a moon-shaped mountain, and a crecent of mountains, in the bay of el Kamar but without being able to discover the semblance of either.

There is a curious coincidence here in names though, taken in connection with the produce of the mountains viz:—That the Arabic name for the frankincense tree is *Kandaru* and the Sanscrit name for the moon *Chandra*, while the mountainous tract from Damkot eastward abounds with the frankincense tree, and is called on to Ras Sajar, Jibal Kamar, or the Mountains of the Moon.

Returning to the islands of Kalaius in the Persian sea, or sea of Oman, we shall find their distance remarkably well measured if we take it from the island of Masira, and not from the mainland, as the author of the Periplus has it. If we follow the coast northward from Masira to the straits of the Persian Gulf, we shall find that in our course we shall meet with only one group of islands, which are about forty miles north of Maskat, and about twenty miles from the shore. These then must be the islands alluded to by the author of the Periplus, for there are no others in this sea; and if we measure the distance from the northeastern extremity of Masira to Ras el Khabba, and from thence to the first of these islands, we shall find it just upon four de-

1 French Translation.

grees, which, allowing 500 stadia to the degree, is the distance which the author of the Periplus states they were off shore; but as Dean Vincent observes, "How islands that lie 200 miles from the coast can be said to be in a bay of the continent cannot be comprehended." Hence there must be some mistake, which I see no other way of reconciling than that mentioned.

I have however gone further with the author of the Periplus than I had intended, and must now leave him with the following remarks by Dean Vincent. "On the southern coast of the peninsula we can trace him, at almost every step, to Fartaque and Ras el Had; but from thence he seems, without entering the Gulf of Persia, to have stretched over with the monsoon, either to Karmania, or direct to Scindi, or to the Gulph of Cambay. At those points we find him again entering into those minute particulars, which bespeak the descriptions of an eye-witness; while, of the parts previous to these, he speaks in so transient a manner, as to create a belief that he writes from the report of others; but on this question it is not necessary to decide, the reader must determine for himself."

Returning to Ptolemy, we require little to identify most of the islands he mentions on this coast, with those mentioned by the author of the Periplus, and with those which exist at the present day. After the straits of Bab el Mandab, come, under the heading *In Rubro mari*: *Agathoclis duæ, Coconagi septem (Pal. tres), Dioscoridis civitas, Occidentalis insulæ finis*, and *Tretæ*; and then under *Et juxta Sachalitem Sinum: Zenobii septem insulæ, Organa*, and *Sarapidis*, (*Pal. Sarapiadis*) *in qua fanum*. Ptolemy's *Insulæ Zenobii* are from sequence and name identified with those of the author of the Periplus, and therefore with the Curiyah Muriyah islands of the present day; if seven, they agree also in number with that of the Periplus; if three, there are only three in the group which deserve the name of islands viz. Hallaniyah, Soda, and Haski; the rest are merely rocks. *Trete* although under the head of "islands" is fixed by Ptolemy's latitudes and longitudes as a place, in the island of Socotra; but when we find other groups of islands in the Gulf of Aden, preceding those opposite Bunder Hisn Ghorab, to identify with his *Agathoclis* and *Coconagi*, and then the island of Socotra to identi-

fy with his *Dioscoridis;* and have still the islands opposite *Kanè*, or Bunder Hisn Ghorab, (the *Orneon* and *Trullas* of the Periplus,) unidentified; with the name of *Trete* in the list of islands, immediately preceding that of *Zenobii; Trete* and *Kanè* in the same latitude; the second port east of *Kanè* called *Tretos; Tretos portus* and *Trete* within thirty minutes of the same longitude, and *Trete* the most southern of the two; with the coincidence of *Trullas portus* being within ten minutes of *Kanè*, and one of the islands opposite *Kanè* called by the author of the Periplus " *Trullas*," etc; it is to say the least of it, strongly to be presumed, that *Trete* was the name of an island or islands, as before suggested; and that these islands were the group opposite Bunder Hisn Ghorab. Besides we know that if *Trete* were in the same parallel of latitude as *Kanè*, it must have been much more than a degree north of Socotra. Next to Ptolemy's *Trete*, if that was his name for the islands close to *Kanè* or Hisn Ghorab, come his *Insulæ Zenobii*, and then his *Organa*, which must have been the little island of Hammar el Nafur, simply because it is the next, and only one between the Curiyah Muriyah Islands and Masira; but it is very small, very insignificent, and close to the shore. Then follows his *Sarapidis in qua fanum*, which both from name and sequence is identified with the *Sarapis* of the Periplus, and with the Masira, of the present day because there is no other island eastward on this coast.

Last of all Ptolemy's places under the head of *Sachalitarum in sinu &c.* which I shall attempt to identify, are his *Didymi montes*. I cannot pretend to itendify his *Neogiala navale* nor his *Hormani flu. ostia.* Gosellin places his *Didymi montes* at Ras el Had, by which he meant the eastern extremity of Arabia, and if Plolemy's appellation is to be taken literally, that is signifying "twins," his *Didymi montes* are identified in Jibal Saffan, which as before stated, are two mountains close together, almost exactly alike, each about 800 feet high, situated on a table-land about 100 feet above the level of the sea, and isolated for several miles from any other mountains; not as Gosellin states, the termination of the chain of mountains which passes through Oman, which do not turn from their course to the eastward, to end at Ras el Had, but continue on southwards to terminate in the mountains of Jallan, about twenty miles inland from the S.E. coast of

Arabia. The next place mentioned by Ptolemy, viz. *Bosara*, may have been Sur, because it is said to have been a city, and there is no other locality hereabouts which possesses the advantages of Sur in point of position, both for such external and internal commerce as this part of Arabia could command. There has most probably always been a town where Sur now is, because there is no other place just here, where there could be one so advantageously situated. The subsequent mention of *Vaticinium sive oraculum Dianæ*, *Abisa civitas*, and *Corodomum promont.*, brings us to the straits of the Persian Gulf, where I must also leave Ptolemey.

Before concluding however, it would be as well to see what tribes lived on the Southeast Coast of Arabia in the time of the author of the Periplus. All that we learn from him in this respect, is, that Charibael was king of the Homerites, (Hamyarites), and Sabeans, and that *Arabia felix* was under him; Aden was therefore in the country of the Homerites. The shore between *Arabia felix* and *Kanè*, that is between Aden and Bunder Hisn Ghorab, he tells us, was inhabited by *Nomades* and *Icthyophagi*, and above *Kanè* was a place called *Sabbatha* where lived *Eleazus*, which was the name of the King who at that time had dominion over the Frankincense Region. Adjoining were the *Atramitæ*, inhabitants of Hadramaut, who were a division of the Sabeans, according to Pliny (lib. xii. c. xxiv.) and whose region extended to the south-eastern coast of Arabia, *a climace usque Sachalites*, according to Ptolemy. Hence we find as before stated, the country of Hadramaut extending to the *Sachalites* of the author of the Periplus, west of Ras Fartak; and to the *Sachalites* of Ptolemy, east of that cape; and the territories of the Sabeans, through some other People, probably on to the shores of Dofar, and Jibal Sabhan, for the Frankincense Region was under them.

Charibael would appear to have had under him the southwestern angle of Arabia, and *Azania* or part of the Somali country opposite,—that Frankincense Region. While Eleazus had the Frankincense Region of Arabia, for the latter lived in Arabia, at *Sabbatha*, and camels brought the frankincense to *Sabbatha*, which city according to Pliny was eight days journey from the Frankincense Region. Hence Southern Arabia was in all probability then, as it is now, peopled by predatory tribes, while the Homerites and the Sabeans held the trade.

What passed through their country, was for protection, transferred from depot to depot, as we see by the remains of the ancient fortress at Hisn Ghorab *(Kanè)*, and another sixty miles inland, up the great valley of Meifah. Moreover, we find that the Gebanites (Kabayle?), took toll of all the frankincense that passed through their territory, after the custom of the Beduins of the present day, (see note p. 303). They were all well paid no doubt, and could be, while the Sabeans and Homerites ruled all the commerce of the eastern and western nations that took this course, and which must have always been, as it is now, preferable to that through the Persian Gulf.

The author of the Periplus, therefore, mentions the names of no people on this coast but the Homerites, the Sabeans, and the Nomades and Icthyophagi; and it would appear, as Gosellin states, from the little allusion he makes to the Sabeans that the Kings of Hamyar had already, in his time, begun to assume supremacy. Nor does Ptolemy note any more, except the *Ascitæ* and *Sachalitæ*, although he mentions the names of many people who lived in the interior. These *Ascitæ* lived next to *Syagros* mountain on the sea. *Juxta autem Syagrum montem usque mare Ascitæ sunt;* they were evidently called after their vocation, (navigators on inflated sacs) which happens to be stated by Ptolemy immediately after his mention of *Syagros extrema*, (see p. 305.) His *Sachalitæ* would appear to be no other than the inhabitants of the *sahil* or maritime plain, (see p. 296.) Hence there is little in Ptolemy or the Periplus to identify in this respect.

It would be interesting, however, to trace the relationship that exists between the names of places and tribes on this coast and some of those mentioned in the Xth. Chapter of Genesis as the descendants of Shem. To wit. the Mahrah, (about whom there is very little known) who claim their descent from the tribe of Ad, (Ad the son of Aws, the son of Aram, the son of Shem?), and who now inhabit the *Aradh el Akaf*, in which the tribe of Ad are said to have settled. The Kathiri, (Gether?) who with the Karah inhabit Dofar and the mountainous tract above; close behind which comes the *Aradh el Akaf* before mentioned. The tomb of Houd, (Heber?) at Hasek, on the borders of the desert of Akaf. The Karah, Korah, or Koreysh, whose head family is called Kahtan, (Joktan?), mixed with the Kathiri and inhabiting Dofar, as well as the mountains

above that district. The Afar, (Ophir ?), a large tribe behind the Karah, again towards the desert of Akaf. The province of Hadramaut, (Hazarmaveth ?) Saba, (Seba ?), etc., are all names which connected with their locality, create an intense desire to know their source. The learned Bochart has done much in this respect, but every step into southern Arabia gives much more to do, and shews us how much more is still behind.

Thus, in conclusion, have we been comparing the south-eastern shores of a country of mountains and deserts; whose inhabitants were once opulent but who are now poor and needy; a country almost without export, yet from this very circumstance, its geographical position, and the undaunted spirit of its inhabitants, destined for a time to become the centre of commerce and one of the richest nations in the world. Without wood for naval architecture, yet with the exception of the European nations, (now, but probably not formerly,) producing the most perfected specimens of this art.[1] The latter probably a consequence of their natural impulse to become the transport agents of produce between the eastern and western nations, the Gerreans from the western shores of the Persian Gulf northwest to Petra; and the Sabeans from the south-eastern angle of Arabia northwards to the same place;[2] thence to Egypt and to Syria. Joseph was sold to a company of Ishmaelites going down to Egypt with their camels laden with spices. The Queen of Sheba, supposed to have been the Queen of the Sabeans, brought from the "south" to King Solomon, "spices and gold in abundance and precious stones," nor was there "any such spice" or brought in "such abundance" as that "which Queen Sheba gave to king Solomon;" (B. C. cir. 992). The Sabeans possessing the produce of the north-eastern part of Africa besides that of their own country, and the produce which was brought to them from India and the eastern islands, were probably by far the richest people in Arabia. About six centuries after the reign of King Solomon the

1 The lines of the model of the "Batilla," or Pirate Vessel of the Persian Gulf, which was sent home to the Grand Exhibition from this, were considered by competent judges to be almost perfect; and the Arabs themselves have a saying, that the use of the "Batilla" ceased only, when the Steam-Vessel was invented.

2 Heeren Historical Researches, etc. Vol. 2 p. 107.

Homerites [1] or Hamyarites sprung up, (from Hamyar son of Saba), in the south-western angle of Arabia, and they after a time eclipsed the name of the Sabeans. Meanwhile the Thebaic Dynasty fell, and Egypt successively passed into the hands of the Persians, the Mecedonians, and the Romans, (30, B. C.) when the latter, influenced by their avarice, and their favourable position, sent an expedition into Arabia to discover the sources from which the Sabeans and Homerites drew their wealth; [3] and a little before the time of the Author of the Periplus, he states, Cæsar destroyed *Arabia felix*, or Aden.[4] Then followed the overthrow of the Hamyaritic dynasty,[5] and in the seventh century, arose Mohammedanism; and we see the Arabians one of the richest nations in the world then becoming the most powerful. Egypt was subjected to the Mohammedans, and while their conquests were extending over nearly half the then known world, Arabia was forsaken, the Khalifat was removed to another country, religious fanaticism seems to have usurped the place of her commercial enterprise at home, and subsequently the latter to have slept under the security of the all providing Korân; when the discovery of the passage round the Cape of Good Hope, at the end of the fifteenth century, threw open the commerce of India to the Europeans through a different route, and thus the ancient office of the Arabians ceased. The East India Company was formed, their first hostile collision with the Indians took place at Surat in 1611, and since that the whole conntry has been subjected to the English. Aden has been seized, the old route of commerce between the eastern and western nations, has again been established, but the Arabs are no longer the carriers of the produce. They have become poor and divided among themselves, the religion of Mohammed is disappearing from among them fast, and they are returning to the heathenism and barbarity of their aboriginal state.

1 B. C. 370 See Gosellin Op. cit. Vol. ii. p. 112, 113. 2 Pocock Spec. Hist. Arab. p 38

3 Strabo (Exp. of Ælius Gallus) L, xvi.

4 Loc. cit. p. 15.

5 The Abyssinians conquered Yaman A. D. 524 and on this occasion the Romans are stated to have lent them 600 vessels to transport their army across the Red Sea to Arabia. (Essai sur l'Histoire des Arabs par A. P. Caussin de Perceval. t. i p 134)

ART. VII.—*An Account of the Agate and Carnelian Trade of Cambay.* By MR. AUGUSTUS SUMMERS, Senior Apothecary at Cambay. Communicated by the Government.

The Agate and Carnelian Trade forms a subject of much interest, although hitherto it has excited little attention, and little desire has been manifested to acquire a knowledge of the varied and complex processes which attend the first procuring of the stones in the rough state, to the ultimate perfection of their finish arrived at by the art of the Lapidary at Cambay. This I shall attempt to detail, and from the following statements of the different Agates and Carnelians, it will be evident, that although they still bear the name of Cambay Stones, and this place has held the reputation for a considerable time of being famed for its agate mines, etc., yet they are really brought here in the rough state from different parts of Guzerat, and are wrought by the Lapidaries here in workshops which have been established for upwards of a century. Although the value of their traffic has been considerably reduced of late years, they still form, next to cloth, the principal articles of commerce, yielding a good profit to the traders, forming a valuable source of revenue to the State, and giving employment to nearly two thousand people, who are engaged in the manufacture of ornaments from them in the busy workshops of this place, amounting in all to about seventy-five large, and twenty-five small.

The traders are Baniyan and Borah merchants, fourteen in number, who purchase the wrought articles from the head lapidaries and send them to Bombay, Djiddah, and other ports.

The workmen or artificers form a distinct corporate body called the *Akkikia Jumat* or *Panchaiyat*, and are designated as follows:—100 *Akkikias*, master artificers or heads of establishments; 300 *Gassias* or workers on lapidary wheels; 200 *Dholias* or polishers on rough and hard polishing stones; 50 *Pattimars*, or polishers on wooden frames; 100 *Badars* or borers who are employed in the drilling processes; total 750. These form the *Panchaiyat* or regularly consti-

tuted tradesmen; besides which, upwards of a thousand people are employed in the different shops as day-labourers, in chipping, cutting slabs, &c. these consist of men and boys, both Hindoos and Mahommedans.

The *Panchaiyat* holds the power of adding to their number; each person on admission pays a few hundred rupees which is spent in dinners. Each department of labour remains distinct, the artisan in one branch will not interfere with, or undertake the work of another branch; and all enjoy distinct privileges pertaining to their respective departments, needless to notice here.

The following are the stones wrought at Cambay:—

Jasper, Heliotrope, or Bloodstone.—A beautifully variegated stone with a greenish base. The green with flame-like streaks, or red spotted delineations, is named by the lapidary *Lila Chantadar*; that more variegated with green, red and yellow tints, is named *Pattolia.* It occurs in massive layers, is hard, breaks with a dull fracture, and takes a high polish.

It is procured near the village of Tankarra in the territory of the Murvi Rajah, about twelve miles north of Rajkote, and is brought from the top of the hill named Bang, also from below the hill under the soil, where it occurs in massive layers, from eight ounces to forty pounds in weight.

Remark.—For permission to collect the stone eight annas per maund, (40 pounds), is paid to the Rajah, and two annas per bullock load, for passing through his territory; four and half rupees per load is paid for bullock-hire to Cambay. A bullock-load contains three maunds, on which a town-duty of eight annas is levied at Cambay.

Moss-Agate.—Named by the lapidary *Sawa Baji.* This is a beautiful species of agate, of a very clear, or clouded, crystalline base; with impressions of dark green moss, or delineations of reddish brown moss. It is found in massive layers, often cracked in various ways, and is hard and receives a fine polish.

It is procured near the village of Tankarra, in the territory of the Murvi Rajah, and at Bud Kotra about three miles from Tankarra.

It is found in the plain, about two feet under the surface of the soil, in massive layers, cracked, and weighing from eight ounces to thirty or forty pounds.

Remark.—The same as that concerning Jasper. See above.

Agate, Common.— A mineral whose base is chalcedony blended with quartz and carnelian. The white or semitransparent is named *Dhola*, and the cloudy and streaked *Jomma*. Its color is generally a grayish white of different shades. It is pretty hard, brittle, and massive, and receives a high polish. It is procured near the village of Mahidpore three miles from Tankarra, in the territory of the Rajah of Murvi; and occurs in the plain near the surface of the soil in massive blocks, the most perfect not exceeding five pounds; the inferior quality and cracked, as high as sixty pounds in weight.

Remark.—The same as that for the foregoing.

Agate, Kupperwange.—This is a beautiful spieces of agate; that having the impressions of mineralized plants delicately preserved, with a clear semi-transparent base, is named *Karriah*; that of variegated shades of color, with landscape or other delineations, is named *Aggiah Ruttia* &c. It occurs in pebbles or rolled masses, is hard and receives a high degree of polish. It is procured at Kupperwange in the Kaira Zilla, and in the bed of the river Majaim, between the village of Amliala and Mandwah, about fifteen miles from Kupperwange, and is found on the banks and in the beds of rivers in rolled balls of spheroidal, reniform, and amygdaloidal figures, from eight ounces to ten pounds in weight.

Remark.—The Bheels search for the stones, and sell them to a Borah at Mandwah, from whom the lapidaries purchase them at from three to twelve rupees per maund, according to their quality. They are carted or brought on donkies to Cambay. Ten maunds of the stone is valued at one hundred rupees, on which a duty of four rupees and eight annas is charged here.

Agate, Veined.—Named by the lapidary, *Doradar*, of different shades of white with dark streaks, or a dark ground with white thready streaks, assuming different forms.

It occurs imbedded in clayey soil, is hard, and takes a very high polish. It is procured at Rhanpore and its adjacent villages, named Darpipla and Ninama, in the Ahmedabad Zilla near Danduka; and is found under the upper strata of soil, in pebbles of various shapes, not exceeding half a pound in weight.

Remark.—A fee of two rupees per cart-load is paid to the Government authorities, and the stones are carted to Cambay. The cart-load is 40 maunds, which pays a town duty of two rupées here.

Chocolate Stone.—So named from its colour, is also called *Katiah*; It is of a brownish earthy base, not very hard, of a dull fracture, and does not take a high polish. It is procured at Rhanpore, near Dunduka, and at Tankarra, in the territory of the Murvi Rajah, and is found on the surface, and a few feet under the soil, in masses from one to eight pounds in weight.

Remark.—It is brought from Tankarra on bullocks, at the rate of rupees 4½ per load, and in carts from Rhanpore, at Rs. 15 per cart-load, besides the Government fee of two rupees per cart-load.

Chrystal.—Named *Phattak*, is a clear transparent stone, resembling glass in appearance, it receives a high polish. It is procured at Tankarra in the territory of the Rajah of Murvi, and is found in masses under the surface of the soil, from one to twenty pounds in weight.

Remark.—This pays the same duty as the other stones in the Rajah of Murvi's territory.

Variegated Stone.—Named by the lapidary *Mi-mariam*, is of a liver brown earthy base, with yellowish impressions of shells and animalcules; having a pretty marbled appearance, but does not receive a good polish. It is procured at Dhokawarra in the Runn, about sixty miles north of Deesa, and is found in large masses on the hill, and dug up in large blocks at its base. From whence it is carted to Cambay.

Lapis Lazuli.—Or the azure stone, named at Cambay, *Rajahwarrad*, is of a deep blue colour, and soft earthy base, with a sprinkling of silvery or golden spots. May be known by its beautiful indigo blue colour. It is soft and does not receive a high polish. It is imported

at Cambay from Bombay, and is brought from Persia and Bokhara. It is said to be found in rounded balls in the beds of rivers.

Jet-Stone or Obsidian.—Named here *Kala phattar*, resembles glass in fracture, is not very heavy and takes a high polish. It is imported at Cambay from Bombay, and is said to occur on the hills at Bokhara, and at Aden in large blocks.

Blue-Stone, named *Ferosa.*—It is of various shades of blue, and is a composition resembling glass, it is soft, and takes a good polish. It resembles the true *Ferosa* when highly polished. It is imported at Cambay from Bombay, and is said to be prepared in China. It is brought from China in flat pieces not exceeding half a pound in weight.

Carnelians,—Named *Gharr*, in their original state. They are cloudy, of various shades of brown, some, and others of different tints of yellow. After exposure to the sun and baking, they assume other tints as follows :

Light-brown becomes white, *Dhola;* pale yellow, rose colour, *Gulabi;* deep yellow, red, *Lal;* a mixture of cloudy brown and yellow, becomes white and red, named *Ablaki;* another shade of yellow turns pinkish purple, named *Nafarmani;* and brown becomes a darker shade, named *Emni.*

They are dug up in large quantities, and after undergoing the process of baking, they receive a high degree of polish, and are wrought into flat and round necklaces, bracelets, armlets, stones for seals, chessmen, marbles, studs, rings, &c. They are procured from the base of the hills of Bowa, B. Abbas and Rajpipla in the territory of the Nadode Rajah, who is tributary to H. Highness the Gaikwar. The Nadode Rajah farms the quarries to native contractors, who pay annually, from Rs. 2000, to 2500 to the Rajah, for the sole privilege of collecting the stones. They are found in the shape of pebbles, imbedded in a soft yellow soil or in bluish-gray clay. These vary to a pound weight, and are chiefly of uneven form and surface.

The other stones found in the neighbourhood or on the hills, and not subjected to the heating process are as follows :—

Mora or Bowa Gori.—A species of Onyx or dark coloured Carnelian with white veins; or a grayish white ground with dark veins, assuming various figures, they receive a high degree of polish and are much prized at Djiddah in Arabia. They are procured on the Bowa Gori and Abbas hills or at their base, or in the bed of the river formed by the monsoon streams between the hills. *Mora* is found on, or at, the base of the hills in pebbles not exceeding a pound in weight. Between the Bowa Gori and Bowa Abbas hills, on the plain, are small mounds, from whence the stones are obtained by the Bheels of the districts. The excavations are of some depth, forming galleries in a horizontal direction, about five feet in height and four broad; the miners are obliged to use a lamp and work in pairs, one is employed with the pickaxe in the quarry, the other at the entrance to examine the stones, which is done by chipping off a piece, the good are retained and the bad rejected on the spot. When a larger number of men are employed, the galleries are extended in different directions, with supports and air-passages. The labour of the two men for the day, or for eight or ten hours, produces from ten to forty pounds in weight of Carnelians, which are brought in the evening to the village of Rattanpore, and transferred to the Contractor or his people. When a large quantity is thus procured, they are exposed in the fields to the sun for two months or more, after which in the month of May generally, a trench is formed in the field two feet in depth and three in breadth. In this, fires of goat and cow-dung are lit up, and the stones in earthen pots, in single rows, are placed in the trench; the fire is kept up from sunset to sunrise, when the pots are removed and the stones piled away. The Contractor attends the heating process; the stones are once a year carted to Nemodra, and conveyed in canoes down the river to Broach, from whence they are brought in boats to Cambay.

Each bag of twenty-five maunds, pays a duty of one and a half rupee to the Bombay Government, at Broach, in addition to the import and export duty at Cambay. The stones are sold to the heads of the lapidary-manufactories. The town import duty is one and a half rupee.

Cat's Eye, named Chasumdar.—The principal colour is gray presenting many varieties usually translucent. It is hard, and has the appearance more or less, of a cat's or bird's eye. It is much esteemed and receives a high degree of polish.*

Rori or Lassunia.—A yellow pebble, semi-transparent, found scantily with Cat's Eyes; takes a fine polish and is much esteemed. It is usually cut for ring-stones. These are found on the Bowa Gari and B. Abbas hills, or at their base; or in the bed of the river formed by the rains between the hills, which is dry in the month of October; and they occur with blunt edges or in rolled pieces, as pebbles, and are of various shapes and small sizes, not exceeding two ounces in weight. They are sought for by the Bheels of the district, and disposed of to the Contractor at Ruttanpore who sells them to the heads of the different lapidary manufactories at Cambay.

Articles wrought by the Cambay Lapidaries.—Those for sale to the gentry passing through Cambay, and sent to Bombay for the English, Calcutta, and other markets, are made of Agates, Blood-Stone, and Carnelians; and wrought into models of cannon, with carriages and appurtenances complete; slabs for boxes; sets of a variety of slabs, twenty in number, to form a square table; cups and saucers, chessmen, flower-vases, penracks, card and letter-racks, watch-stands ink-stands, knife-handles, rulers, paper-cutters, paper-weights, penholders; sets of necklaces, bracelets and broaches of a variety of patterns, crochet-needles, silk-winders, marbles, brace and shirt-studs, and seals; also rough specimens of stone with one side polished.

Articles wrought for China, are comprized of only two kinds, and are made entirely of Carnelians. First the oval and square flat-stones resembling watch-seals, large and small named *Mogli gool*, worn as armlets and dress ornaments; second, the beads named at Cambay *Dhol*; each necklace containing fifty beads, these are all plain polished.

* What is called Cat's Eye generally is *Fibrous quartz*; these are not *fibrous quartz* but small globular agates formed of concentric layers. They are very commonly used in Bombay as charms for sore eyes. They are set in copper or silver rings, and are let out or purchased as required. Ed.

and round. Vast quantities of them are annually exported from Cambay, to Bombay for China; the extent of valuation is from 50,000 to 60,000 rupees annually.

Articles for the Mocha, Djiddah, and Mecca markets are made out of the veined Agate from Rhanpore, Carnelians from Rattanpore, the Cat's eye, and Jet or Obsidian; these are worked into large quantities of rings both plain and ornamented, ring stones, wristlets, armlets and necklaces, embracing the following varieties:—

Necklaces:—*Pailudar Dhol*, cut beads; *Gukradar Dhol*, Diamond cut beads; *Badami Arr*, almond shaped neklace; *Khantli*, oblong flat necklace; *Chamakli*, spear shaped; *Madaliyah*, *Tawitch* or *Tahviz*, composed of three stones; *Sadah Khanta*, plain round beads, used as a necklace and rosary.

Armlets and Wristlets:—*Mutia Madaliyah* composed of two stones, worn as an armlet or wristlet; *Paitah*, a wristlet composed of seven round flat stones; *Ponchi*, a wristlet composed of several flat stones; *Baijutah*, an armlet of one stone cut into a fanciful device.

Single stones in the shape of large flat seals called *Nimghul*.

Rings:—These are made of Carnelian of various devices named *Ungotee*; ring-stones for setting, called *Naggina*, are made of Carnelian and Cat's eye.

The articles for the Djiddah and Mocha markets are packed up in Chests, also in bales with cloths, and exported to Bombay, and Veraiwul Bunder near Diu, where they are reshipped to their destination.

Manufacture of the different articles.

Beads.—The following is the process of making Beads:—The stones are first broken into pieces of the size desired. An iron spike named *khondia* is driven into the ground in an inclined direction with one point upwards, the stone is placed on this point, and chipped with a hammer made of horn, till rounded; it is then passed on to the polisher, who fixes a number, of equal size, in a pair of wooden or bamboo clamps, and rubs them on a coarse and hard polishing stone called *Dholia*; these are then transferred to another man, who securing them

in a wooden clamp, rubs them against a grooved polishing board named *pattimar*, on which is smeared a composition of emery and lac, turning the beads round so that every part of the surface might assume a globular form and become polished. The final polish is given, by the beads so prepared, being put from one to several thousands, into a stout leather bag, about two feet in length and from ten to twelve inches in diameter, with some emery dust and very fine powder, named *wurry*, (the sediment from the carnelian deposited in an earthen dish partially filled with water, during the process of drilling holes in the beads, which is always collected and dried,) the mouth of the bag is then tied up, and a flat leather thong or tape is passed round its centre, after which it is rolled by two men seated at opposite ends of a room, towards each other, from ten to fifteen days; during which time it is kept moistened with water. When the beads have taken a bright polish, they are passed on to the people who bore the holes, which is effected by means of a steel drill tipped with a small diamond; during which process the spot is fed with water drop by drop, passed through a thin narrow reed or metallic tube.

The Cut-Beads, are passed from the rough polishing stone to the lapidary-polishing and cutting plate, and lastly the holes are drilled.

Knife Handles. These undergo exactly the same process as the cut-beads and are shaped to any pattern.

Cups and Saucers, and other hollow articles are wrought according to the required external shape on the steel spike, and a rough polish given on the rough polishing stone; the cavity is formed by the diamond tipped drill, to the depth of one fourth of an inch, all over the space until it exhibits a honeycombed surface, when the prominent parts round the holes are then chipped away, and this process repeated, until the depth and form desired is obtained. They are then polished upon prepared moulds of convex formation, and of the same composition as the polishing plates, which are attached to the turning wheel.

Cannon. The bore of the cannon is effected by a drill with two diamonds, to the depth required; afterwards five other drills successively increasing in thickness are substituted, each having, an

increase in the number of diamonds placed circlewise, the last containing as many as twelve diamonds.

Slabs, Paper-cutters P. weights &c.—are cut by means of a toothless saw made of iron ; and fixed to a light wooden frame ; the cut is fed with emery dust and water ; when the stone is small the saw is worked by one man, when large by two men. The stone to be wrought upon is attached to a large wooden frame, which is fixed in the ground. The cement consists of a coarse description of bees wax with the fine fibres of new cloth, by means of which the stones are firmly attached to the wooden frame work. Several men, in a row, are at the same time employed cutting through different pieces of stone.

Table prepared from returns of the Cambay Custom-House, exhibiting the values of the Traffic in wrought Cambay Stones and Export-Duty thereon, for the two official years 1848-49 and 1849-50, commencing in May and ending in April :

	Small Packages.	Large Packages.	Bamboo Baskets.	Large Boxes.	Bags of Carnelians sent in large bales of cloth.		Total value of Carnelians sent each year.			Customs duty on the part of the British Government.		
	Beendry.	Keesa.	Kemdin.	Patio	Bales	Bags.	Rupees.	a.	p.	Rupees.	a.	p.
1848-49	10	3	13	23	49	312	1,08,423	..	..	1,350	4	..
1849-50	18	1	11	6	98	536	94,902	..	..	1,186	4	6

In the above table the export duty levied by the Nawab is not given ; the amount exactly trebles that of the British Government, which is calculated at one rupee and four annas per cent. on valuation ; this is independent of private fees levied by the Nawab's native officials.

ART. VIII.—*Extracts from the Proceedings of the Society for the year* 1849-50.

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BUIST'S (George L. L. D.) Rain-Gauge.....	The Author.
BIBLES and BIBLICAL LITERATURE, catalogue of, published by J. C. Stewart..	Rev. Dr. Wilson.
CHURCH MISSIONARY RECORD, 14 Nos. of, with a report of the Bombay Auxiliary Church Missionary Society, and No. 10 of 1850...	Rev. C. Isenberg.
CHRESTOMATHIE HINDIE ET HINDOUIE a l'usage des Eleves de L'Ecole speciale des Langues Orientales Vivantes pres la Bibliotheque Nationale. Published under the direction of M. Garcin de Tassy.	M. Garcin de Tassy.
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Ditto.———Ditto.———Ditto.....	The Govt. of B'bay.
COOVERJEE RUSTOMJEE MODY, Gujarathi Version of his Prize-Essay on Female Infanticide.....	The Govt. of B'bay.
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GRANT (Col. C. W.) on Bombay Cotton and Indian Railways.	———
GRIFFITH'S (W. Esq.) Itinerary Notes on Plants collected in India and the neighbouring countries, 1837 to 1842.....	The Govt. of B'bay.
——Icones Plantarum Asiaticarum, Part II, On the higher Cryptogamous Plants.....	———
——Notulæ ad Plantas Asiaticas, Part II, On the higher Cryptogamous Plants.....	———
HALAY RAE'S Futtuhgurh Naman in Hindoostani.	Sir H. M. Elliot K. C. B.
HODGSON'S (B. H.) Essay the first, on the Kooch Bado, and Dhimal Tribes, in three parts. Part 1st Vocabulary, 2nd Grammar, 3rd Location, numbers, creed, customs, condition, and physical and moral characteristics of the people.....	The Author.
HUNTER'S (A.) Report on the Pottery of India.	The Govt. of B'bay.
JOURNAL of the Indian Archipelago and Eastern Asia, Nos. 10 to 12, of Vol. III, 1849, and Nos. 1 to 8, of Vol. IV, 1850.....	The Editors.
——Nos. 10 to 12, of Vol. III, for 1849, and Nos. 1 to 8 of vol. IV. for 1850.....	The Govt. of B'bay.
LASSEN'S (C. Von) Indische Alterthumskunde. Zweiter Band	The Author.
MUHLEISON'S (John) Genuine and Spurious Religion, a compendious, scriptural and consecutive view of the origin, development, and character of different systems of belief. Vols. 2.....	———

	DONORS.
MONTGOMERY'S (Robert) Statistical Report of the District of Cawnpore.....	The Govt. of B'bay
NEWBOLD'S (T. J.) Political and Statistical account of the British Settlements in the Straits of Malacca. Vols. 2.	The Author.
OBSERVATIONS made at the Magnetical and Meteorological Observatory of Bombay for the year 1847, under the Superintendence of C. W. Montriou, Commander I. N....	The Govt. of B'bay.
REPORT of the Smithsonian Institution, exhibiting its Plans, Operations, and Financial Condition, up to January 1st 1849.	The Board of Regents.
——— of the proceedings of the Vernacular Society of Guzerat for the year 1849.....	A. K. Forbes, Esq.
——— of Criminal Cases determined in the Court of the Sudder Foujdaree Adawlut of Bombay, compiled by A. F. Bellasis Esq. B. C. S.	The Govt. of B'bay.
——— of the Calcutta Public Library, from February to December 1849.....	The Society.
——— Thirty-fifth, of the Bombay Education Society for the year 1849.....	———
——— on a General Scheme for Extramural Sepulture.....	T. S. Cowie, Esq.
——— of the Board of Education of Bombay for the years 1847-48.....	The Board.
——— Ditto. ——— ditto. ———ditto..	The Govt. of B'bay.
——— Annual, of the Grant Medical College Bombay for 1849-50.....	The Superintendent.
——— Ditto. ——— ditto. ———ditto..	The Govt. of B'bay.
REPORTS Medical, selected by the Medical Board from the records of their Office and published under the sanction of the Madras Government.....	The Medical Board,

	DONORS.
SOCIETE DE GEOGRAPHIE, Bulletin de la. Troisieme Serie. Tome XII.....	The Society.
SOCIETY, Royal Asiatic, of Great Britain and Ireland, Journal of. Vol. XII, Part II.....	———
——— Ceylon Branch of the Royal Asiatic, Journal of. Nos. 1, 2, 3, and 4, for 1846-47 and 48.	———
———Royal Astronomical, Monthly Notices of, containing papers, abstracts of papers, and reports of the proceedings of, Vol. VIII. from November 1847 to June 1848, with one Supplement. Vol. IX. Nos. 8 and 9, and Vol. X. to May. No. 7.	———
——— Royal Astronomical, Memoirs of, Vols. XVII. and XVIII.	———
——— Bombay Geographical, Transactions of, Vol. IX. from May 1849, to August 1850.	———
UTTARA RAMA CHERITRA. A Drama	Rev. P. Anderson.
STARKEY'S (Captain) Dictionary, English and Panjabi, also Dialogues English and Panjabi, with Grammar and Explanatory Notes.	Sir H. M. Elliot K. C. B.
SYKES' (Lieut. Col. W. H.) Contributions to the Statistics of Sugar, produced within the British Dominions in India.—Statistics of the Civil Justice in Bengal.—On the fall of rain on the Table-land of Uttree Mullay, Travancore, during the year 1846.—Discussion of Meteorological Observations taken in India.....	The Author.
TABLEAUX DE LA REVOLUTION FRANCAISE. Vols. 2. folio.....	The Govt. of B'bay.
WILSON'S (The Rev. John D. D.), Short life of the Apostle Paul, with a Summary of Christian doctrine as unfolded in his Epistles. In Sanskrit version	The Author.

	DONORS.
WIGHT'S (Robert) Icones Plantarum Indiæ Orientalis, Part IV. Vol. IV.....	The Govt. of B'bay.
——— illustrations of Indian Botany Part III. Vol. II.	———
ZEITSCHRIFT der Deutschen Morgenlandischen Gesellschaft herausgegeben, Von den Geschaftfuhrern. Heft I. II. and IV. 1850....	The Society.
ZEITSCHRIFT fur die kunde des Morgenlandes herausgegeben, Heft II. and III. Von Christian Lassen.	———

PRESENTS FOR THE MUSEUM.

Antipathes Spiralis, two large specimens of, from the Straits of Malacca..	Dr. Bremner.
Bag, made in Coorg by stripping the bark off a species of *Upas Antiaris* entire. These bags are closed at one end by a solid piece of the tree and are used for holding grain &c.	J. L. Blane, Esq.
Calcareous Incrustations, from a Calciferous Spring at Baneshwar near Nassapoor....	H. B. E. Frere Esq.
Cobra de Capello, specimen of	W. Hameg, Esq.
Coal, specimens of, from Kala Bagh.....	Col. Hallet.
Coins, five Silver and fourteen Copper, from Peshawar *(a)*	Col. Jervis.
——— Gold, one with Persian Inscription (Mohur, Mohammed Shah, 23d year of his reign, A. H. 1153.) *(b)*	The Govt. of B'bay.
——— Gold 24 viz. 1. Finam Annesgondee.—19 Pagodas.—4. Mohurs: Alumgheer, A. H. 1170. Shah Jehan, A. H. 1037. Shah Jahanabad, A. H. 1111. Jahandar Shah, A. H. 1124, *(c)*	———

(*a.*) See this Art. Proceedings Off. Lit. and Sc. 18th April 1850. (*b.*) Id. (*c.*) Id.

	DONORS.
Crocodilus Gangeticus, skin of, from Surat. ..	A. F. Bellasis, Esq.
Dendritic Limestone, portion of taken from a quarry about 30 miles from Neemuch. It is of the same kind as that of the Southern Maratha Country, and is quarried in like manner in large slabs.	Dr. Malcolmson.
Diorite, Magnetic, portion of, (discovered by Capt. Jenkins 10 Madras N. I. See Asiatic Journal, No. CCII. page 410.)	Dr. Spilsbury.
Elephas Asiaticus, portion of tusk of, from the valley of the Nerbudda near Bettaree. (Fos.)	———
——right side of lower jaw of, (a young animal,) containing a part of the molar tooth. (Fos.)	———
Geological Specimens collected about Travandrum and Cochin by General Cullen; consisting of Limestones, Lignites, Fossil Resin and Graphite	Dr. Buist.
Hippopotamus, portion of the right jaw of, containing the two posterior molars. (Fos.)..	Dr. Spilsbury.
Iron ore, specimen of, common to the neighbourhood of Saugar..	———
Janthina and Porpita, specimens of, collected between Bombay and the Cape of Good Hope.....	Capt. Montriou.
Laterite, Granite, &c., specimens of, collected from the neighbourhood of Vingorla....	N. A. Dalzell, Esq.
Mineralogical specimens collected at the Mauritius and Aden by Dr. Malcolmson.....	Dr. Malcolmson.
Quartz Rock, specimen of cellular, from Shahgurh near Dhamoree, in which is disseminated a large quantity of red and green oxide of Copper, together with crystalline calcareous spar.	Dr. Spilsbury.

	DONORS.
Red-clay, specimens of, possessing a columnar structure, from Trap-Rock, near Kolapoor, collected by Dr. Broughton.....	H. B. E. Frere, Esq.
Rock-specimens, a collection of, from the island of Bombay, consisting of greenstone, traps, basalts, clays and aqueous deposits; also of rocks foreign to the island of Bombay but found on its shores.....	Dr. Buist.
———specimens, collected from Maskat in Arabia, Persia, and Babylonia.....	Capt. Newbold.
———Salt, specimens of from Kala Bagh....	Col. Hallet.
Sculptures, fifteen fragments of, procured from a ruined Temple on a hill in the Eusof-Zai country, collected by Lieut. Miller.....	Dr. Arnott.
Talcose Sandstone, specimen of, light yellow, fine grained, containing here and there small red globular ferruginous concretions of the same material; found 40 miles south of Chandree.....	Dr. Spilsbury.
Talc-Schist, specimens of, containing specular iron ore, collected by Dr. Malcolmson from the hills above Pali, 60 miles north of Peshawar	The Hon'ble J. P. Willoughby.
Trap-Tufa, specimens of, from the island of Bombay.....	Dr. Buist.
Woods, specimens of, used at Peshawar for building, and all other purposes requiring timber of a strong and lasting nature; collected by Dr. Malcolmson.....	The Hon'ble J. P. Willoughby.

ORIGINAL COMMUNICATIONS.

	COMMUNICATED BY.
Anderson (The Rev. P.) some account by, of the Bhatti Kávya or Poems of Bhatti. 18*th April* 1850. *(a)*	The Author.

(a.) See last No. of Jl. p. 20.

	COMMUNICATED BY.
Anderson (The Rev. P.) Some account, together with Fac-simile Devanágarí transcript and translation by, of a Copper-plate Inscription in the Society's Museum. — 15*th August* 1850. *(a)*	———
Carter (H. J. Esq.) Observations by, on the Serpentine Rocks and Aqueous Strata of Mascat and its Neighbourhood. — 16*th May* 1850 *(b)*.....	———
Jacob (Major LeGrand) Fac-similes of Inscriptions in Ancient Sanscrit by, taken from Copper-plates found in the Sawant Wari Teritory, with translations. Second contribution.—24*th January* 1850. *(c)*.....	———
———Fac-simile and Translation of a Copper-plate Inscription in Sanskrit by, dated A. D. 1435, recording the Grant of a village called Varadengi, to one Pashun Sheti ; by Nagadew, a descendent of Dewa Sherma.—19*th Sep.* 1850. *(d)*	———
Newbold (Captain T. J.) a descriptive list by, of Rock-Specimens from Maskat in Arabia, Persia, and Babylonia. 24*th March* 1850. *(e)*	———
Perry (The Hon'ble Sir E.) Account by, of the Great Hindu Monarch Asoka, chiefly from the Indische Alterthumskunde of Lassen.— 21*st Nov.* 1850. *(f)*	———
Robertson (Captain A. C.) Memoranda by, on Mud-Craters situated in the District of Lus, with Map and Sketches.—21*st Feby.* 1850. *(g)*	Captain S. W. Hart

(a) See this No. of Jl. p. 213. *(b)* See last No. p. 118 (c) See this Art. Proceed. Offi. Lit. and Sc. *(d)* To be inserted in next No. *(e)* See last No. p. 26. *(f)* This No. p. 149. *(g)* See last No. p. 8.

	COMMUNICATED BY.
Stevenson (The Rev. J., D D.) Observations by on the Grammatical Structure of the Vernacular Languages of India. No. 2.—21*st Feby.* 1850. *(a)*	The Author.
Summers (Augustus) An account by, of the Agate and Carnelian Trade of Cambay.—19*th Sep.* 1750. *(b)*	The Government.
Taylor (Captain M.) Ancient Remains at the Village of Jiwarji near Ferozabad on the Bhima.—13*th June (c)* 1850.....	Dr. Buist.
Wilson (The Rev. Dr. J.) Memoir by, on the Cave-Temples and other ancient Buddhist and Brahmanical and Jaina Remains of Western India.—15*th Augt.* 1850. *(d)* ..	The Author.
————Supplement by, to Ditto. 19*th Sep.* 1850. *(e)*	————
————on the Villages and Towns named Hadhar mentioned in the Sacred Scriptures, with the identification of the Hazor of *Kedar* with the *Hadhra* of the Arab Geographers, and the *Hatra* and *Atra* of the Greeks and Romans.—24*th Oct.* 1850. *(f)*	————

PROCEEDINGS, OFFICIAL, LITERARY AND SCIENTIFIC.

With reference to Government letter, General Department, No. 276 of 1850, forwarding 26 Gold Coins for the Society's inspection and report, with permission to select such as might be useful in the Society's cabinet, it was resolved, that they should be handed over to C. J. Erskine, Esquire, C. S., with the Society's request that Mr. Erskine would favor it with any observations on them which he might consider worth offering, and also be kind enough to select from them such as might be useful in the Society's collection.

(a) See last No. p. 1. *(b)* This No. p. 318. *(c)* Idem. p. 179. *(d)* See last No. p. 36. *(e)* Seet his Art. Proceed. Off. Lit. and Sc. *(f)* To be inserted in the next No.

The Government letter, General Department, No. 255 of 1850, calling attention to 268 Gold Coins submitted to Mr. Erskine for examination in February last; it was stated, that the papers which had been prepared respecting them were in the possession of Dr. Wilson, *Honorary President*, now in Sindh, and that they would be obtained if possible before his return. The *Secretary* was requested in the mean while to make this reply to the Government.

Major Jacob's fac-similes, etc. of ancient inscriptions before mentioned, were then laid before the Meeting. They are stated by Major Jacob to be of a subsequent date to those of the "Nerur Plates" presented to the Society by Government in the month of June last, and are, respectively, of the years A. D. 933, 1261, and 1391. The Copper-plates from which they were taken are now in the hands of native gentlemen, who refuse to part with them, from a supposition that they possess some mystic virtue.

"No. 1, of A. D. 933, records a grant, in the Shalivahun year 355, by a sovereign of the *Yadu* race Gowindraj, of the village Lohagram in the District of Rampur, to Keshew Dikshit, son of a Brahman fellow-student; the language is pure Sanskrit, but inflated with gigantic hyperbole, puerile conceits, and far fetched metaphors, containing little matter to compensate the labor of finding out the meaning.

"No. 2, of A. D. 1261, shews the Chàlùkyàs [after their overthrow by the *Yadu* race] to be again in the ascendant, and reigning at "Kalyán,"—Kanwadew the King—his Minister, Keshew Mahájani, bestows the village Terwatak, the modern Terwun in the Rajapoor Talooka, on certain Brahmuns, and the deity Vimaleshwar; the latter said still to enjoy his portion. The Sanskrit is not grammatical; the character approaches much nearer to the modern type; the inscription is probably the same as that of whichan imperfect copy and translation are given in the R. A. Society's Journal, Vol. V, page 177.

"No. 3, of A. D. 1391, is an interesting relic of the Beejanuggur dynasty, founded, according to Ferishta in A. D. 1344, by Bilal Dew, Raja of the Carnatic, who named it after his son Beeja * * * * This inscription gives only, the following genealogy: Achyut married to *Shree—Bukkaraj—Harihar*; the first named is not spoken of as

a sovereign, but the second is. * * * * * In alluding to Wigaya, it says, that Bukkaraj here lived as an Indra, defying all his enemies; and as no mention is made of Achyut's deeds, or residence, the inference is that Bukkaraj was the first of the race who established himself in power in this quarter. Harihar is described as ruling over the whole of the Indian Peninsula, that is washed by the ocean; and it seems doubtful whether supremacy to the Indus be not claimed; his Prime Minister, the aforesaid Madhawa, whom he invested with the sovereignty of Jayantissur, conquered Goa from the Turushkas (Turks), and re-established there the worship of the ancient idols which they had uprooted. This victorious personage, before transferring control over the Goa country to another Minister, named Narahari, granted to the parties named in the plates the village of Kuchchar, called also Madhawpur: this village, the modern Kochré, is not many miles from the present Goa frontier."

Dr. Buist in presenting the collections of Geological specimens before noticed, accompanied them with many interesting observations, more particularly as regards the specimens collected from the Island of Bombay. The several localities and extent of the Basaltic eruption, the positions of the Greenstone, White Trap, Trap-Tufa, and their varieties, were pointed out; also the localities of the aqueous deposits, consisting of the Kankar formation, Blue Clay with its Lignites, &c. and the Shell-Concrete, all of which Dr. Buist conceives to belong to the Newer Pleiocene series.

Among the rocks foreign to Bombay, Dr. Buist would, as far as his observations extend, place the Laterite, there being no doubt about the others, which have been brought to Bombay by ship as part of their ballast.

Of the specimens forwarded to Dr. Buist by General Cullen, Dr. Buist could state nothing but on conjecture, further than that which was contained in the list which accompanied them. The collection was extremely interesting, inasmuch as it contained specimens of Lignite, Mineral Resins, and Graphite, said to come from the Laterite formation; the latter from Trevandrum, the former from the Late-

rite deposits about fifteen miles S. of Quilon. They are found in common with Carbonaceous Clays and Pyrites, and, according to General Cullen, appear to extend all along the coast from Cape Comorin to Cannanore. Captain Newbold had noticed them at the latter place and at Baypore. They would also appear to be confined to the coast and shores of back waters, sometimes occuring on a level with the sea, at others on high laterite cliffs, as at Purkolly.—*2nd January*, 1850.

The letter from Cursetjee Jamsetjee Esq., (Secretary to the Committee appointed on the 25th April 1841, to carry into effect certain resolutions respecting a testimonial to the memory of the late Sir James Carnac,) having reference to a bust of Sir James Carnac now standing in the northern landing place of the Town Hall, requests, on behalf of the Committee, that the Society will do it the favor to receive this bust and its pedestal into the Library, as a temporary measure.

The *Secretary* was requested to acknowledge the receipt of this letter, and to express the Society's willingness to comply with the Committee's request.

Respecting the Gold Coins before noticed, presented by the Government, and those by Colonel Jervis, it was resolved that, the former should be handed to C. J. Erskine, Esquire, C.S., and the latter to the Rev. Dr. Stevenson, with the Society's request that these gentlemen would, respectively, favor the Society with a description of them.

In reply to the letter from J. Henry, Esquire, Secretary to the Smithsonian Institution, Washington, presenting the society with the Reports and Volume before mentioned, also requesting in return a complete set of the Society's publications; it was resolved that the best thanks of the Society should be transmitted to the Board of Regents of the Smithsonian Institution for the valuable presents referred to; and that a copy of each No. of the Society's Journal already published, as well as a copy of all Nos. hereafter published by the Society should be sent to the Smithsonian Institution.

The Reports of this Institution state, that it originated in a bequest of property to the amount of $ 515,169 by James Smithson, Esquire

of England, in trust to the United States of America, to found an Institution at Washington in the testator's name, which Institution was to have for its object, *The increase and diffusion of knowledge among men.* This trust was accepted by the Government of the United States, and the Institution established by Act of Congress August 10th, 1846.

The volume alluded to, is on the "Ancient Monuments of the Mississippi Valley:" it is the first of the "Smithsonian contributions to knowledge."

Mr. Smith, in adverting to the deficiencies in the Society's Library, stated, that among the list of Subscribers to "Layard's Nineveh" were the Hon'ble the Court of Directors for 40 copies, and that the Society might, in all probability, be presented with a copy from this source, if it would only take the trouble to apply for it. The *Secretary* was requested to make an application through the proper channel to this effect.

Further, Mr. Smith wished to know what had been done in the way of procuring a better supply of books for the Society since the last resolutions were passed relative to this subject.

The *Secretary*, in reply, stated that the *Committee of Management* had determined on meeting once every three months for the purpose of making selections from such Standard Works as might be recommended for the Library, and that the resolutions referred to, having come into operation on the first of the year, the meeting of the *Committee* alluded to would be held in the month of March.

Dr. Stevenson stated that he thought it advisable, for the purpose of insuring a systematic selection, to call upon each member to send in a list of the Standard Works in which he might think the Library most deficient, and that these lists should be brought before the meeting of the Committee mentioned. The *Secretary* was requested to make arrangements accordingly.

The following communication was made to the Society by Dr. Buist respecting the Laterite on the shores of Bombay: "I mentioned, in explaining the character of the specimens presented at last meeting, that it was doubtful whether the Laterite lying in blocks and pieces around Sewree might not have been brought thither by

the hand of man. I now no longer entertain any doubt about the matter, I find pieces of Laterite strewed all around the shores of the Island; at Sewree, Worlee, Lovegrove and Breach Candy; and on the shores of Salsette, Trombay and Elephanta, and all around the Islands of Henery and Kenery; and I have no doubt it will be found over a large expanse all up and down over our coasts. It is mentioned by Prinsep as existing in the blue clay at Calcutta, exactly as it does in our blue clay here, only that it is 150 feet under the surface. It was brought up in boring for water in 1837. Whatever may have been its transporting cause, it could not, under these circumstances, have been an artificial one. Within the Tropics we do not recognise the agency of Glaciers or Icebergs at the level of the sea.

Laterite is so hot and brittle, and so easily destroyed by the agitation of the waves, and these fragments are mostly found within the reach of the breakers, that it must, at no great distance of time, have been much more plentiful than at present. A few years hence, in all likelihood, every trace of it will have vanished from our shores, unless beyond the reach of the sea. I found some specimens of tuffa, in addition to those formerly presented, which may form a set of themselves illustrative of trap disturbed or flowing in a viscid state when in the act of cooling. Most of these are stratified or streaked; in some of them the spar which usually fills drusy cavities or veins has already come into existence amongst fragments of hard or semi hard matter not quite in contact with each other. I have lived most of my lifetime in the midst of trap-formations yet the phenomena here are altogether new to me."—21*st February*, 1850.

The Rev. J. M. Mitchell read an extract of a letter from Dr. Graul of Leipsic, containing a strong request that the Bombay Branch of the Royal Asiatic Society would aid in the rendering into English of the Gujaráti versions of the Zendavesta as one important contribution towards the elucidation of the Zend text. After some discussion, the following resolution was unanimously agreed to,—viz., "That the desirableness of having an English translation of the Gujaráti version and the commentary of Framjee Aspandiarji on the Zendavesta having been brought forward, the Society fully recognizes the importance of the proposal, and resolves to discuss it more fully at its next meet-

ing; appointing in the mean time the Rev. Dr. Stevenson, Rev. J. M. Mitchell, C. J. Erskine, Esq., and H. Green, Esq., to consider and report on the whole question."—21*st March*, 1850.

The Committee appointed to report on the question of rendering into English the Gujaráti version of the Zendavesta, by Framjee Aspandiarji, reported, that after full inquiry, it was convinced of the desirableness and practicability of the scheme, but as several modes of carrying it into execution had been suggested, they would beg permission to report on this specific point to a future meeting. The Society agreed to the report and continued the Committee.

Tables which had been drawn out by C. J. Erskine Esq., relative to the inscriptions and dates of the Gold Coins, submitted for description to the Society by the Government, with its letters No. 346, 276, and 572, dated repectively, 7th February 1849, 19th January and 15th February 1850, were laid before the Meeting with the following observations on those which accompanied the letter No. 346.

"There are 268 of these Coins and they are of three kinds, viz.—1, Fanam or Fulum, 261 Pagodas or Nand, and 6 Mohurs.

There is only one Fanam, of Annesgoondee, which seems to be correctly described in the list attached to the Collector's letter.

There are 6 Mohurs, which are described in the first appended lists

The remaining 261 Coins are Pagodas. They are of one or other of the following kinds. *Dharwaree, Hurpunhullee, Yekeree, Mohammed, Shahee,* and *Savanooree.* But there are several species included in some kinds, especially in the *Yekeree* and *Savanooree.* Some information on these details is given to the second appended list.

All these kinds of Pagodas are mentioned in Prinsep's list, but not all the species.

This kind of Fanam is not mentioned."

The Society expressed its thanks to Mr. Erskine for the great trouble he had taken, and requested the *Secretary*, after having had copies made of the Tables to forward the originals to Government with all the Gold Coins, excepting those which, by the kindness of Government, the Society had been allowed to select for its own Cabinet. (See p. 333.)

The Antique Coins presented by Colonel Jervis, *Vice-President*, to

the Society, at its Meeting held on the 21st February last, (See p. 333.) and subsequently submitted to the Rev. Dr. Stevenson for examination, have been thus described by that Gentleman:

"There are 2 Bactrian Coins of Menander with Greek and Bactrian Inscriptions; 3 Rajput Coins, two of which are of Srí Samugur Deva, and the other Srí Syálapa Deva. The copper Coins, (one Indo-Scythian of four different types,) are described, as well as the silver ones, in Wilson's Ariana Antiqua as far as I have examined them."

Dr. Buist exhibited a large mass of specular iron ore, containing plumbago, from Southern India; also a piece of lignite from the blue clay of Sewree; and compared the formation of sulphate of iron in the latter with that of the lignites found on the Malabar Coast near Cochin.—18*th April*, 1850.

Fifteen fragments of sculpture, procured from a ruined temple on a hill in the Eusofzai country, by Lieut. Miller, 1st Fusiliers, were presented to the Society by Dr. Arnott, Surgeon of the same Regiment.

In Dr. Arnott's letter which accompanied these interesting remains, it is stated, that the hill on which they were found is on that part of the Eusofzai country which borders on Suwat, and not far from Sergao, the scene of operations of Brigadier Bradshaw's Force in December 1849.

There appears to be no traditionary account of this temple among the neighbouring inhabitants, and the sculptures, which have a strong Grecian style seem to shew from the manner in which they are fractured, that the Temple was intentionally destroyed.

It was resolved that these remains should be handed over, with Dr. Arnott's letter, to the Rev. Dr. Wilson, *Honorary President*, with a request that Dr. Wilson would favor the Society with any account that he could obtain respecting them.—13*th June*, 1850.

The following letter from John Ritchie, Esq. having been read, the *Secretary* was requested to acknowledge the receipt of it, and to express the Society's best thanks for the readiness with which the

Directors of the Peninsular aud Oriental Steam Navigation Company had complied with the Society's solicitation.

No. 71 of 1850.

Bombay, 22d June, 1850.

To H. J. CARTER, Esq., *Secretary B. B. R. A. Society.*

SIR—Referring to your communication of the 13th April, I have the pleasure to inform you, that the Directors of this Company have agreed to allow the monthly transmission by this Company's Steamers to Alexandria, free of expense, of a small packet of books, for the Bombay Branch of the Royal Asiatic Society.

I have the honor to be, &c.

(Signed) JOHN RITCHIE, *Supt.*

—18*th July*, 1850.

The Honorable Sir Erskine Perry's letter enclosed one to his address from Dr. Blyth, Curator of the Museum of Natural History at Calcutta, relative to the deficiency of specimens from the Western side of India, which exists in that Museum.

Mr. Blyth states, "we hardly possess a specimen at present from the Western side of India, rich as we are in the productions of most other parts of the country, from the Himalayas to Ceylon inclusive, and also of the regions lying eastward of the Bay of Bengal.

"I wish that you could introduce me to some one in the Western Presidency who takes sufficient interest in the Natural History of the country, to procure for me certain zoological *desiderata*, for which I should be happy to reciprocate in any way, by doing my best to supply whatever may be wanted from this part.

"Among the Mammalia, I particularly wish for the perfect skeleton, or skull only, and skin prepared for stuffing, of the *Ghorkhar* or Wild Ass of Cutch, Sindh, &c., for comparison with the Tibetan *Kyang*, which I believe to be the same animal.

"I also want the entire skeleton, if possible or skull with teeth, of the beaked Dolphin of the Indus, which is a distinct species from the Gangetic *Soosoo*.

"Likewise specimens of the Wild Sheep and Goats of the Sulimani mountains, and extreme N. W. Himalayas.

"Again, we want skulls of both sexes, and skins for mounting of the Asiatic Lion. We have the perfect skeleton and the well-mounted skin of an African Lion from Algiers. Another Feline animal I want is the true Cheeta, or Hunting Leopard, *F. Jubata*, skin and skeleton.

"Among the smaller Mammalia the Bats would be particularly acceptable."

"Of birds, I want much to *see* collections from Mahabuleshwar and from Sindh; and I would return such collections, labelled, if kindly lent to me. I have drawn up a list of the birds of India generally, Burmah and the Malayan peninsula, including those of Sindh, so far as I know them, and of Assam, Ceylon, the Nicobars, &c. &c. But my knowledge is very limited of those of the Bombay Presidency.

"In other classes, I need only say, that specimens of Reptiles, Fishes, and Crustacea in spirit, are most acceptable; as also of Shells, whether marine or land, and freshwater. I could spare a collection of most of our Bengal Shells from my own private stock, and should be glad to send them to whoever would undertake to supply me with the Bombay species."

Sir Erskine Perry regrets, that there is no allowance made by Government for enabling the Society to obtain a Curator for its Museum, in order that the whole of the Natural History of this part of India might be at once brought under the eye of its European and Native population, both for instruction, and ultimately for the advantage of the country.

The Secretary was directed to inform Sir E. Perry, that Mr Blyth's letter should be handed over to the Museum Committee, with a request that they would make any exchanges with Mr. Blyth which might be mutually advantageous to both Museums.

In Dr. Buist's letter was also enclosed one to his address from Patrick Chalmers Esq., M. P. for Arbroath stating, that Mr. Chalmers had directed two copies of his magnificent work on the Sculptured Monuments of Angus to be forwarded to Dr. Buist's address; one of

which, on their arrival in Bombay, Dr. Buist intimated his intention to present, at Mr. Chalmer's suggestion, to the Society.

The following is an extract from Mr. Chalmer's letter relative to these monuments:

"I am much pleased to hear that these Monuments have excited some little curiosity in India. It is from the East that I have always looked for some explanation of the symbols on the earliest monuments, some of which may possibly date before the introduction of Christianity into Britain. I confess that the strong resemblance that some of the figures bear to those on Abraxas, leads me rather to the belief, that gnosticism was mixed more or less with our Christian faith, in these Islands at some time; and it is recorded in the Chronicle of Lanercost, that in the 13th century, the rites of Bacchus were openly celebrated by the Parish Priest of Inverkeithing; though it is also recorded that, the knife of some of the disgusted parishioners exacted the penalty of his misdeeds ere many months elapsed. What you mention of the supposed discovery of Druidic remains in India is very interesting. I should like much to see drawings of them. A friend of mine here thinks, he has traced the relation between the Runes and Oghams of Ireland, and Britain, and Scandinavia, and the Rock inscriptions of Asia Minor, and the arrow-headed characters of Babylon &c, and that he can read the one by the other. I observe that an Armoric student has arrived at a like conclusion independently. Both, however, are deficient in the knowledge of eastern languages, and the same value cannot attach to their lucubrations as to the coincident and independent discoveries of Dr. Hincks and Major Rawlinson. However, the proofs of the ancient course of Eastern Commerce, afforded by the discovery of Cufic coins and Asiatic ornaments, weapons, &c. prepares one for a connection, more or less, in letters."—*15th August*, 1850.

With reference to letter No. 890, dated 22nd ultimo, from H. B. E. Frere, Esq., Commissioner at Sattara, forwarding a list of Sanskrit Books which are in a Temple at Sattara, and offering to procure copies of any of them which the Society may think worth procuring, it was resolved—" that Mr. Frere's letter and accompaniment be circulated for the observations of those Members who are engaged

in the study of Oriental Literature, and that the Secretary be requested, in the mean time, to acknowledge their receipt, with the Society's best thanks, and to inform Mr. Frere of the Society's proceedings respecting his kind offer."

The Sanskrit Inscription and Translation, before mentioned, by Major LeGrand Jacob, forwarded in Government letter No. 3891, dated 19th ultimo, for any remarks the Society might have to offer on it, was handed over to the Rev. Dr. Stevenson, with the Society's request, that Dr. Stevenson would favour it with any observations which he might consider the subject to deserve.

The letter dated 22nd June last from Richard Clarke, Esq., *Honorary Secretary* of the Royal Asiatic Society, announces the dispatch to the Society's address, through Mr. Richardson, of some copies of the Society's revised Regulations; also states that henceforth all non-resident Members of the Society will be required to pay an annual contribution of one *Guinea*, in consideration of receiving the Journal.

The *Secretary* announced the publication of the XIIIth No. of the Society's Journal,

The Rev. Dr. Wilson, President of the Commission appointed for obtaining authentic information relative to the number and situation of the Monuments and Cave-Temples of Antiquity in the Territories under the Bombay Government, stated, that he had completed his "Memoir" on those remains of antiquity; which had been printed in the No. of the Society's Journal above noticed; and that 60 extra copies had been struck off, in anticipation that the Government would take them for distribution to the principal local authorities, in order that descriptions of any Cave-Temples or other Monuments of antiquity of the Presidency, which were not enumerated therein, or might have been since discovered, might be communicated to the Commission.

The *Secretary* was requested to address the Government accordingly, and to state the views of the Commission regarding further proceedings in these interesting inquiries.

Dr. Wilson read the following Supplement to his "Memoir :"—

"In my Memoir notice has been taken of several *structural temples*

in different parts of the country which appear to be coeval with the excavated temples, both Buddhist and Brahmanical. Of one of the latter description, first discovered, I believe by Vishnu Shastri, who reported its existence to Mr. Law, and situated in the Taluka of Kalyan, I have the pleasure, in consequence of Dr. Gibson's attention, of exhibiting to the Society several illustrative drawings. It is decidedly of a *Shaiva* character; and though originally built of the most substantial material, it has been considerably injured by the hand of violence, and has long ago lost its sacredness,—one of the many illustrations of the fact noticed in the 'Memoir' under the head of *Elora*, that the form of religion which the oldest Shaiva temples embodied has vanished from the Mahratha country, probably on withdrawment from it, by a change of sovereignty, of the patronage of the Chola Rajas, by whose influence it seems almost certain, the ancient Brahmanical excavations and Jhaina structural Temples were constructed. In this temple there is a *trimurti*, or three-headed Shaiva, proved without doubt to be of this god, not merely from the general representations of the Shaivas, which attribute creation, preservation, and destruction to their favourite deity, but from the embracement in its unity of *Parvati* the spouse of Shiva. The figure, strange to say, is not only monstrous, but from its multiplex and factitious heads and skeleton legs, of as grotesque and deformed a character as can be conceived. It is singular that its breasts in front seem ornamented with *clerical bands;* an authority for such appendages which will not add greatly to the dignity of our associations connected with their use. The efforts of the Hindu artist were probaly directed to the representation of that gravity and austerity by which Shiva, as the prince and patron of ascetics is characterized; but he has ultimately made greater demands on the visible than the devotional faculties. The *beau ideal* of his nasal organ, one is almost tempted to believe, to have been the tortured and contorted proboscis of some inveterate snuffer!

At the close of the last meeting of our Society, one of the members, Captain French, mentioned to me, that he had observed an excavation in Khandesh, of which he had not noticed any published account. He has had the goodness to write to Lieut. J. Rose, now

in that province, for more information respecting it. While it turns out to be of an insignificant character, the inquiries made in connexion with it have led to the discovery of a small series, of Buddhist caves, with a *Chaitya*, which are possessed of very considerable importance. The following is an extract from the narrative of the visit of Mr. Rose to, and inspection of, these caves.

"When within less than eighty yards of the caves, it was almost impossible to believe the guide that the excavations he described were so near, though he pointed to the exact spot. The ravine is much grander, and the approach to the caves wider than at *Ajanta* and there were evident marks of their being frequented by wild beasts; but although I was quite prepared for all comers, not even a bear showed itself.

"I have spoken of the *caves;* but only one excavation deserving the name is remaining.

"This exactly resembles some of those at Ajanta.

"The arched roof and pillars covered with paintings of human figures &c., are just the same. The figures are very distinct in many instances, and women and men seem to be mixed. There is nothing about them unchaste; and in general they have circles, or what are sometimes called "glories" round their head, similar to those given in the fancied *representation of our Saviour.*

"One drawing struck me particularly, in which a female is represented with long ringlets, just as ladies sometimes dress their hair in our own time. This figure was quite fair, and yet close to it was a very dark female likeness of the *Habshi* caste of features, with very black curly hair.

"The stone here was much more brittle than at *Ajanta*, or *Elora;* and consequently some of the pillars are broken and the excavators failed in their attempt to represent arched rafters, as they succeeded in doing at Ajanta, for the same reason.

"The other three caves here are in fact nearly blocked up, from the rock falling down from above. One of them, however, on your descending into it over the fragments of rock, is in tolerable preservation, though none of them appear to have been quite completed, as is also the case at *Razah* and *Ajanta.* Where the rock had given

way, before the chisel, the masons had neatly substituted stone, and this is the case at Razah as I or rather Colonel Twemlow observed.

"In the painted cave, the paintings are plastered over with a coating of chunam.

"The only sculptures are two or three representations of elephants, tigers, bullocks, and deer, or goats, cut out in small dimensions back to back, like our lion and unicorn.

"There may have been other sculptures and inscriptions; but if there ever were, they have fallen into the ravine below, as the rock is constantly giving way.

"These caves, the guide, an old man, said, were never visited by a 'Sahib' before, though Marathas and even Brahmans come to see them and bathe in the river below. While I was there, it began to thunder and grow cloudy, and I got wet through, but I do not regret my visit to the *Pepolhow*, and should like to repeat it. I am going to see if there are any more caves in the hills of which we have not heard. I wonder how it is that none have been found in *Satpuda* yet. No natives of this country could, I think, have drawn the cave-paintings. The Greeks, or Italians, must have helped them; and indeed at Elora there is a woman's figure cut out in stone of such fair proportions as to shew that it is the work of an artist quite superior to those who executed the bulk of the unwieldy figures there.

"In the new caves I am alluding to, there is a neatness in the little sculptures I have mentioned."

These interesting notes of Mr. Rose, Dr. Wilson observed, do not throw any light on the comparative age of these Buddhist excavations. It would be well if the paintings which they bring to light could be speedily copied.

The explanation of the peculiarities of the female figures which are noticed is not difficult. As the Buddhist religion in the ages of its glory prevailed not only throughout India, but throughout the countries lying north of its boundaries, and beyond the Indian Caucasus, and Tartary and Tibet, its *Buddhas* and *Dhyani Buddhas*, and their female productions or associates, the *Dhyani Bothi Satwas*, are frequently represented as attended by devotees and servitors of

varied clans and colour. *Buddha* himself, and the *Dhyani Buddhas* and *Bodhi Satwas*, in their typical form, as seen in India, Nepal, Ceylon, Burmah, Siam, Pegue, China, and Tartary, are depicted and sculptured with curly hair and rather large lips, which the Buddhists, according to a strange taste, enumerate among the points of beauty. Mr. Hodgson of Nepal, when examining the learned priest, whose answers form the substance of his most interesting and highly valued, 'Sketch of Buddhism,' put to him the question 'What is the reason for Buddha being represented with curled locks?' and received the following answers—'*Addi-Buddha* was never seen. He is merely light.' But in the pictures of *Kairochina*, and the other *Buddhas*, we have the curled hair; and since in the limbs and organs we discriminate thirty two *(lakshanas)* points of beauty, such as expansion of forehead, blackness of the eyes, roundness of the head, elevation of the nose, and archedness of the eyebrows; so also the having curled locks is one of the points of beauty; and there is no other reason for Buddha's having been represented with curled locks.' Mr. Hodgson adds in a note:—'This is the true solution of a circumstance which has caused much idle speculation: though the notion is no doubt an odd one for a sect which insists on tonsure.' The colours of the five *Dhyani-Buddhas* are as follows:—"*Kairochina's* appropriate colour is white; *Akshobya's* blue; *Ratno Sambhava's* yellow or golden; *Amirabha's* red; and *Amogha Siddaha's* green. Those of their respective *Bodhi Satwas* are correspondent.

It is to be hoped that Mr. Rose will be able to explore a considerable part of the *Satpuda* range, which has hitherto been much neglected. The connexion with it from time immemorial of the Aboriginal *Bhils* who have submitted neither to Brahmanism nor Buddhism, but who have so long preserved the Turcoman worship of ghosts and demons, is no reason why we should not expect to find within it considerable numbers of Buddhist Monks, who could easily conciliate by their largesses the wild sons of the Indian forest, as well as the monks of the eastern Churches, who could conciliate the roving sons of the Egyptian, Syrian, and Arabian deserts."—*19th September*, 1859.

The following letter from H. B. E. Frere, Esq. Commissioner, Sattara, was read :—

No. 1031 of 1850.

To H. J. Carter, Esq., *Secretary B. B. R. A. Society.*

SIR,—I have the honor to forward per Bhangy Dawk, a Manuscript Volume of Arabic and Persian Inscriptions from Bejapoor, collected and copied by Hoossein Sahib Bhangay and Mahommed Ali Bhangay, Rogendars of Bejapoor, two of the few Mahommedans belonging to the place who possess a competent knowledge of Persian, and some acquaintance with Arabic.

2. These gentlemen assure me that they have taken great pains to make the collection full and accurate, and I can testify to their great industry and zeal in huntiug out many inscriptions which had previously been unnoticed. They have thus been enabled to add a very great number of inscriptions to those noticed by Doctor Bird, in his paper on the subject published in the Society's Transactions. Some of them appear very curious and well worth preserving, and I trust that the zeal of these Gentlemen in collecting such a contribution towards the antiquarian history of their native place, may be considered worthy the favorable notice of the Society.

3. There are in the ruins of the Citadel at Bejapoor, near the Eastern gate, 10 or 12 long and very distinct Canarese Inscriptions, of only a few of which Mr. Walter Elliot, the great authority on Canarese antiquities, procured abstracts. They are cursorily noticed by Doctor Bird. I have hitherto been unable to get complete or trustworthy copies, owing to the difficulty of finding any one sufficiently acquainted with the ancient Canarese dialect to transcribe them. But as they probably, like all such inscriptions, contain valuable historical data, it would be very desirable to get perfect and accurate copies or impressions of them, and if forwarded to Mr. Walter Elliot, no doubt, good use would be made of any information they contain. The letters, though very clear, are so small, and the stone so uneven, as to defy all the attempts I made to get a good impression ; but they are evidently easily legible by any one who understood

the old dialect of Canarese, and possibly by giving publicity to the fact that they exist, and that accurate copies would be acceptable to the Society, some Canarese Scholar visiting the place might secure copies.

Sattara 24*th* Sept. 1850. } I have the honor to be, &c.
(Signed) H. B. E. FRERE.

Resolved :— That Mr. Frere be requested to state to the Society, in what manner they can best express their thanks to Hossein Sahib Bhangay and Mahommed Ali Bhangay for the manuscript, volume of Arabic and Persian inscriptions from Bejapoor, and whether a present of books would be appreciated.

With reference to M. Moirot's letter, accompanying the XIIth Vol. of the "Bulletin de la Societe de Geographie" it was resolved : That it should be acknowledged with the Society's best thanks, and the Nos. of the Society's Journal applied for therein, forwarded to the Parisian Geographical Society, by the earliest opportunity, with a request, that the preceding Nos. of that Society's Journal, might be presented to the Bombay Branch of the Asiatic Society in return.

A similar resolution was also passed respecting the request of the Imperial Academy of Sciences at St. Petersburgh, and the *Secretary* directed to forward a complete set of the Society's Journal to the address of the Perpetual Secretary.

The letter from Government relative to taking off the Society's hands the extra copies of the Honorary President (Dr. Wilson's) "Memoir on the Cave-Temples, &c.," and complying with the Society's request, that they might be distributed to the parties named by the Society, for the purpose of eliciting still further information on these monuments of Antiquity in Western India; also intimating the desire of Government to reimburse the Society for any expense incurred in endeavouring to carry into effect the wishes of the Hon'ble the Court of Directors in this respect,—was handed over for reply to the Commission appointed by the Society to direct their attention to this subject.

In return for the valuable MS. volume of Arabic and Persian

Inscriptions collected at Bejapoor, and presented through H. B. E. Frere, Esq. Commissioner for Sattara, at the last meeting, it was resolved :—That as Mr. Frere coincided with the Society, (in the suggestion above mentioned) that a present of books to the gentlemen who collected these inscriptions would be highly appreciated,—the Rev. Dr. Wilson be requested to expend a sum not exceeding Rs. (100) one hundred, to be laid out in the purchase of Arabic or Persian works for this purpose.

The Rev. Dr. Wilson brought forward a successful oil painting and sketch of some groups of figures in the Caves of Elephanta by Mr. Fallon, whose talents the Society considered richly deserving of of the countenance and encouragement of Government in pourtraying the beautiful remains of these ancient caves.—*24th October* 1850.

ANNIVERSARY MEETING.

Monday, the 25th November 1850.

The minutes of the last Meeting having been read and confirmed ; the following gentlemen were elected for the Committee of Management, Museum-Committee, and Auditors of the ensuing year viz :—

Committee of Management.

C. J. Erskine, Esq.	W. Howard, Esq.
S. S. Dickinson, Esq.	J. Smith, Esq.
H. Young, Esq.	J. Patton, Esq.
Lt. Col. J. Holland.	A. H. Leith, Esq.
C. Morehead, M.D.	Rev. P. Anderson.

Museum-Committee.

C. J. Erskine, Esq.	Capt. C. W. Montriou,
H. J. Carter, Esq.	A. H. Leith, Esq.
H. Coneybeare, Esq.	Capt. J. G. Forbes.

Auditors.

Col. G. Moore.	A. Spens, Esq.

It was proposed by Capt French, seconded by Captain Forbes, for consideration, at the next Meeting:—"That the annual subscription be reduced to Rs. 60, from the 1st January next."

Captain French seconded by Alexander Burn, Esq. also moved—"That the Committee of Management be requested to report on the best mode of proceeding to obtain the permission of Government, for transferring the Library and Museum of the Society to the large Room of the Town Hall, and the expense which would attend it."

The "Cape Town Mail" from the 1st January 1851, was ordered to be added to the list of Periodicals.

ERRATA.

Page.		Line.			read	
213		6	"	The reare	—	There are.
243		13	"	*Maccocephalu*	—	*Macrocephalus.*
250	Foot-note	3	"	Mahara مهرا	—	Mahrah. مهرة
265		37	"	Saiyad	—	Said.
251		11	"	Mahara	—	Mahrah.
—	Foot-note.	"	"	مهرا	—	مهرة
290		5	"	*Trallas*	—	*Trullas.*
291		30	"	Makadahah	—	Makdahah.
		31	"	"	—	"
		33	"	*Kané*	—	*Cana.*
294		21	"	Ras l' Assidah	—	Ras el Asidah.
342		14	"	not	—	soft.
337		19	"	*Hadhar*	—	*Hazor.*
337		20	"	*Hadhra*	—	*Hadhar.*
349		12	"	*Mahratha*	—	*Maráthá.*
"		15	"	*Jhaina*	—	*Jaina.*
"		29	"	visible	—	risible.
350		36	"	*Razah*	—	*Rozah.*
351		21	"	*Razah.*	—	*Rozah.*
"		15	"	*Pepolhow*	—	*Pipalkhora.*
"		34	"	*Bothi*	—	*Bodhi.*
352		10	"	*Addi*	—	*Adi.*
"		11	"	*Kairochina*	—	*Vairochana.*
"		22	"	"	—	"
"		"	"	*Ratno Sambhava's*	—	*Ratna Sambhava's*
"		23	"	*Amirabha's*	—	*Amitabha's.*
"		"	"	*Amogha Siddaha's*	—	*Amogha Siddha's.*
"		30	"	*Turcoman*	—	*Turanian.*

NOTE TO THE ARTICLE ON ASO'KA.

Sir Henry Elliot in his valuable Supplemental Glossary, p. 78, points out a passage in Abúl Fázl which describes the removal of the Delhi Lat from a town in the district of Uánsi. I learn also by an interesting communication from that distinguished scholar, that he has discovered an inscribed column 18 miles southwest of Simla, the characters of which appear to be Thibetan, and which will probably turn out to be another monument of Asóka.—E. P.

JOURNAL

OF THE

BOMBAY BRANCH

OF THE

ROYAL ASIATIC SOCIETY.

JANUARY, 1852.

ART. I.—*On the Villages and Towns named Hazar and Hazor in the Scriptures, with the Identification of the Hazor of Kedar.* By JOHN WILSON, D. D., F. R. S., Honorary President of the Bombay Branch of the Royal Asiatic Society.

Read, October 24th, 1850.

THE Hebrew words חצר HAZAR and חצור HAZOR, literally signifying an "enclosure," a "court," a "pasturage," and a "village," are used as the names of various towns and villages which have often been overlooked, confounded, and misplaced by writers on biblical geography and prophecy.

HAZEROTH was one of the stations of the Israelites in the wilderness. (Num. xi. 35; xii. 16; xxxiii. 17, 18.) It was doubtless situated in the valley of *el-Hadhar*, north of Mount Sinai.*

A HAZAR-*Addar* and HAZAR-*Enan* are spoken of in connection with the borders of the Holy Land. (Num. xxxiv. 4, 10.) The Canaanitish Avim are represented as dwelling in HAZERIM. (Deut. ii. 23.) In the apportionments of their land which fell to the tribes of Judah and Simeon we find several Hazors, mentioned in the following connections:—"And it [the south border of Judah] passed along [from Kadesh-barnea] to HEZRON, and went up to *Adar*," [probably the HAZOR-*Addar* of Num. *ut sup.*] (Josh. xv. 3.) "And the uttermost cities of the tribe of the children of Judah, toward the coast of Edom

* See "Lands of the Bible," Vol. I. pp. 256—260.

southward, were Kabzeel, and Eder, and Jagur, and Kinah, and Dimonah, and Adadah, and Kedesh, and HAZOR, and Ithnan, Ziph, and Telem, and Bealoth, and HAZOR-*Hadattah* [the "new Hazor," erroneously given in our English version as two different places], and Kerioth, and *Hezron*, which is HAZOR,* Amam, and Shema, and Moladah, and HAZAR-*Gaddah* [village of the kid], and Heshmon, and Beth-palet, and HAZAR-*Shual* [the village of the jackal], and Beersheba," etc. (Josh. xv. 21—28.) "And they [the children of Simeon accommodated in the tribe of Judah] had in their inheritance Beersheba, Sheba, and Moladah, and HAZAR-*Shual*, [already mentioned,] and Balah, and Azem, and Altolad, and Bethul, and Hormah, and Ziklag, and Beth-marcaboth, and HAZAR-*Susah* [the village of the horse]." (Josh. xix. 2—5.) "And they [the descendants of Simeon] dwelt at Beersheba, and Moladah, and HAZAR-*Shual* ..... and at Beth-marcaboth, and HAZAR-*Susim* [the village of horses, given before in the singular form]..... These were their cities unto the reign of David." (1 Chron. iv. 28—31.) None of these Hazars, so far as I know, have been identified in modern times, though the sites of some of the contiguous towns have been seen or visited by late travellers. This, however, is a matter of comparatively little consequence, as they are not associated with any historical events or prophetical descriptions of much consequence. HAZOR-*Gaddah* was probably near *Engedi*, the fountain of the kid.† The designation of HAZOR-*Susah* or *Susim*, proves the existence of the horse in the South of Canaan before the Israelites entered it under Joshua, a circumstance which is often overlooked. This animal was very scarce in the country till the time of Solomon. The Jewish kings were forbidden to multiply to themselves horses, probably to keep them, in their religious separation, from dependence on foreign countries, their own rough and hilly province not being in general suitable for rearing that quadruped.

A HAZOR, belonging to the tribe of Benjamin, is simply mentioned in Neh. xi. 33. It was probably not far from Bethel, and was perhaps identical with, or not far from, *Baal*-HAZOR, near Ephraim, at which Absalom's sheep-shearers were employed. (2 Sam. xiii. 23.)

HAZAR-*Hatticon*, (or the middle Hazor or village,) by the coast of Hauran, and HAZOR-*Enan*, by the border of Damascus, are mentioned by Ezekiel (xlvii. 16, 17,) in connection with the boundaries of the restored Holy Land.

* Mentioned also in Josh. xv. 3.

† Jerome and Eusebius say of *Gadda*, "Est autem hodieque villa in extremis finibus Doromæ contra orientem, imminens Mari Mortuo.—Eclog. de Loc. Heb.

A more important place than those now referred to was the HAZOR of King Jabin, the capital of all the kingdoms adjoining the upper lake of the Jordan, which was taken and destroyed by Joshua, (Josh. xi. 1—13, &c.); which afterwards partially recovered its strength, and under another king of the name of Jabin, oppressed the Israelites, and sent out against them its armies under Sisera, when they were overcome by Deborah and Barak, its king being at the same time destroyed, (Jud. iv. 1—24; 1 Sam. xii. 9); which was rebuilt, or enlarged, by Solomon, (1 Kings ix. 15); and which was taken by the Assyrians, on their invasion of Canaan under Tiglath-Pileser, (2 Kings xv. 29). This strong and fenced city fell to the lot of the tribe of Naphtali, on the division of the land among the tribes of Israel. It is thus mentioned in the enumeration of their fenced cities, seemingly made from South to North:—"Ziddim, Zer, and Hammath [the warm baths near Tiberias], Rakkath [Tiberias],* and Chinnereth, and Adamah, and Ramah, and HAZOR, and Kedesh, [now Kades,] and Edrei, and *En*-HAZOR, [the well of HAZOR,] and Iron [or Ijon]," &c. (Josh. xix. 35, 36). In the notice of the Assyrian conquests, it is thus given in an enumeration, probably proceeding from North to South:—"In the days of Pekah, king of Israel, came Tiglath-Pileser king of Assyria, and took Ijon, and Abel-beth-maachah, and Janoah, and Kedesh, and HAZOR, and Gilead, and Galilee, all the land of Naphtali, and carried them captive to Assyria." (2 Kings xv. 29.) It would appear that this Hazor lay to the South of Kedesh Naphtali, which is on the heights overlooking the waters of Merom, now called the Lake Huleh. Josephus (Antiq. v. 5, 1,) says that Hazor was situated above this lake, to which he gives the name Semechonitis (*αὕτη δὲ ὑπερκεῖται τῆς Σεμεχωνίτιδος λίμνης*). Eusebius and Jerome only allude to its situation as in the tribe of Naphtali.†

There is still another HAZOR mentioned in the Scriptures, and that in an important portion of the prophecies of Jeremiah:—

"CONCERNING KEDAR, AND CONCERNING THE KINGDOMS OF HAZOR, WHICH NEBUCHADREZZAR KING OF BABYLON SHALL SMITE, THUS SAITH THE LORD:—

Arise ye, go up to Kedar, and spoil the men of the East.
Their tents and their flocks shall they take away:
They shall take to themselves their curtains, and all their vessels and their camels;
And they shall cry to them, Fear is on every side.
Flee, get you far off, dwell deep, O ye inhabitants of HAZOR, saith the Lord;

* Talmud. Cod. Megill. fol. 5, col. 2; "Lands of the Bible," Vol. II. p. 117.

† Sub. voc. *Asor*:—"Asor, in tribu Nephtalim, quam rex Assyriorum populasse scribitur."—Heron. Ecloga de Loc. Heb.

For Nebuchadrezzar king of Babylon hath taken counsel against you,
And hath conceived a purpose against you.
Arise, get you up unto the wealthy nation that dwelleth without care, saith the Lord,
Which have neither gates nor bars, which dwell alone;
And their camels shall be a booty,
And the multitude of their cattle a spoil;
And I will scatter unto all winds them that are in the utmost corners,
And I will bring their calamity from all sides thereof, saith the Lord,
And HAZOR shall be a dwelling for dragons, and a desolation for ever:
There shall no man abide there, nor any son of man dwell in it."

(Jeremiah xlix. 28—33.)

HAZOR is evidently mentioned here as the *capital of Kedar*, in the same way as in the context Heshbon and Ai are spoken of as principal cities of Moab, and Bozrah as the capital of Edom. It is doomed by the prophet, not as an actual possession of the Israelites, such as Hazor in the neighbourhood of Kadesh Naphtali was, but as in a distant and hostile nation, that of *Kedar*, analogous in this respect to Edom, and Moab, and Elam, introduced to our notice in the same course of prophecy. It is represented as a secluded place, in the "East," and "in the utmost corners," the wealth of the dependencies of which principally consisted in flocks, and herds of camels, and in tents, and their equipages. It is obviously such a place as is not to be sought in a rough hilly country, where the latter description of animal would be found nearly or wholly useless. I request the members of our Society to mark these circumstances at the commencement of our inquiries as to its locality.

Dr. Keith, in the thirty-sixth edition of his admirable work on the "Evidence of the Truth of the Christian Religion, derived from the literal Fulfilment of Prophecy," says, with reference to the passage of Jeremiah now referred to:—"In the previous editions of this treatise, the author could not adduce any illustration of this prediction, after having long sought in vain for any recognition or identification of the city itself, either by historians or travellers, except the vague, and therefore unsatisfactory notice by Burckhardt, who had heard of but not seen 'the ruins of a city called Hazouri.'" He then goes on to identify the Hazor of Jeremiah with that of Jabin, repeating its history to the time of Solomon, and thus proceeds:—"'At the end of an hour and a half,' east by south from Paneas, on the route to Damascus, says Burckhardt, 'we came to *Ain-el-Hazouri*, a spring, with the tomb of Sheikh Othman-el-Hazouri, just over it; to the north of it one hour are the ruins of a city called *Hazouri*. The mountain here is overgrown with oaks, but contains good pasturage.'" "The name Hazouri,"

Dr. Keith adds, "is well known at Paneas: it designates the ruins; Ain Hazour, the fountain of Hazour; and Djebel-Hazour, the hill of Hazor. The ruins are not, as stated to Burckhardt, an hour's distance from the spring, but comparatively near it, on the opposite side of a grove of noble oaks..... The name remains, but the city is no more; and literally, as the word of the Lord revealed the existing fact, though long unknown in other lands, *no man abides there, nor does a son of man dwell in it.*"*

In this supposed identification, the excellent and learned author of the most popular work which has yet been published on the subject of which it treats, falls into three errors of considerable magnitude.

1. The "*Hazour*" of the flanks of Jebel Heish, above the castle of Banias, to which he here refers, cannot possibly be *Hazor*, the capital of Jabin. This site is quite separated from the possessions of the tribe of Naphtali, in which that town, as we have seen, was situated. It is east of the territory formerly belonging to the Sidonians, and ultimately taken possession of by the tribe of Dan. It lies to the east of the Jordan, in the territories which, in the Land of Promise, we know were allotted to the tribes of Reuben and Gad, and the half tribe of Manasseh.

2. The *Hazor of Jabin* is not the *Hazor mentioned by Jeremiah*, which, as we have already seen, is connected with *Kedar and Arabia.*

3. The *Hazor of Jebel Heish*, also, has no geographical connexion with *Kedar and Arabia*, from which it is quite remote. In its lofty position, among the roughnesses of the mountains, it is perhaps one of the last places which could be thought of as the capital of a country abounding with camels.†

Dr. Eadie, a countryman of Dr. Keith, in his convenient Biblical Encyclopædia lately published, has avoided confounding the Hazor

* Keith on the Evidence of Prophecy, pp. 150—153.

† Since this paper was laid before the Society, the Journal of the Royal Asiatic Society, Vol. XII. Part 2, has been received in India. At page 359, I find the following statement in the late Capt. Newbold's paper "On the Country between Tyre and Sidon and the Jordan":—"My friend the Rev. Mr. Thomson, of Beirút, suggested to me the examination of Hunin as the site of the great Hazor, so celebrated in the days of Joshua, and subsequently. I am, however, inclined to think that Hazor lay further East, and that its site is pointed out by a mound in the valley of the Jordan, between Hasbeiya and Banias, called by the Arabs Tel Gházor." Mr. Thomson may be correct in his conjecture about the identity of Húnin and the Hazor of Jabin; but as there is no similarity in the name, and several ancient sites of Naphtali in this district remain yet undiscovered, there is yet no certainty about the matter. Captain Newbold has overlooked the fact that the Arabic correspondent of Hazor is *Hadhor*, and not *Gházor*.

mentioned by Jeremiah with that of Jabin. "There is a remarkable prophecy," he says, "respecting a Hazor in Jer. xlix. 28—33. The connection shows it to have been in Arabia, and the whole scope of the prophecy denotes a place of great importance. It is, however, blotted out, though some have conjectured that it is another name for Petra."

So many places mentioned in Scripture, which have for ages disappeared from the view of the civilized world, have been lately brought to notice, that we have not despaired of the recovery of even this HAZOR. Before hazarding an opinion, however, on its situation, we have to seek for the district of KEDAR itself, with which, as we have seen, it is associated by Jeremiah.

The country of KEDAR derived its name from Kedar the son of Ishmael. (Gen. xxv. 13.) In several passages of the sacred Scriptures it is connected with Arabia. (Isaiah xxi. 13—16 ; Ezek. xxvii. 21.) Its people are alluded to as dwelling in tents, and, according to some interpreters, with the sons of Kedemeh, settled in the "East,"* as in the passage we have introduced from Jeremiah. (Song i. 5 ; Ps. cxx. 5.) Pliny couples its people, the Cedrei, with the Nabatai,† the descendants of Nebaioth, the eldest brother of Kedar. The Chaldæan paraphrast identifies these people (Ezek. xxvii. 21), and he translates the "flocks of *Kedar*" (Is. lx. 7) the "flocks of the Arabs."‡ Jerome, in his comment on Isaiah, says that Kedar was "an inhabited region beyond Arabia of the Saracens" ; and in his Loc. Heb. that it was in the "wilderness of the Saracens." Eusebius and Jerome, in the Ecloga, or Onomasticon, place this wilderness of the Saracens "beyond Arabia to the South," "opposite the coast of the Red Sea." Theodoretus, commenting on Psalm cxix., says: "Kedar was the second son of Ishmael, and his posterity dwell to this day not far distant from Babylon." Suidas in his Lexicon makes the same remark, adding that Kedar is a place of obscurity, for in Hebrew it denotes what is dark.

It appears to me that according to these authorities Kedar, dis-

* Bochart thus writes :—"Jacobus ὁ μακαρίτης, affinis meus, quem honoris causâ nomino, hunc nodum ita conatur exsolvere in notis ad Genesin nondum editis : *Noæ posteritas ab Armeniæ montibus progressa fuerat in eam regionem quæ postea dicta est* קדם *Kedem a Kedmâ novissimo Ismaelis filio.* Gen. xxv. 15. *Secundus Ismaelis filius est Kedar. Hos duos fratres vicinas habuisse sedes colligimus ex Jerem.* xlix. 28. *Ascendite Kedar ut vastentur filii Kedem. Postea vero cum inquit Moses,* Gen. xi. 2, *egrederentur ex Kedemo invenerunt vallem in terra Senaaris. Sic locum hunc interpretandum censemus."*—Phaleg. i. 7.

† Plin. lib. v. cap. 22.

‡ Reland Palest. p. 96.

tinctively so called, is to be sought in the Eastern portion of that part of Arabia, according to the ancients, which is now called the Syrian desert, or in the country contiguous to that wilderness; and the question arises, Is there any Hazor whose position and other circumstances suit the description of Jeremiah to be found in that region of the world? That the Hazor of Jeremiah,—if without authority we extend the name Kedar to the Arabian peninsula,—could not be in the south of Arabia, will afterwards appear.

To the question now proposed I venture to reply in the affimative. In a remarkable oasis of the desert and alluvial plains between the Tigris and the Euphrates, lying to the S. W. of Mosul, there is a town, the Arabic name of which حضر or الحضر,—*Hadhar*, or *el-Hadhar*, given by the Arabic geographer Edrisi,—is the exact correspondent of the Hebrew חצר HAZAR or HAZOR. He speaks of this place as an "agreeable town on the banks of the Tirthar."* This place, though its coincidence with the Hazor of Jeremiah has not yet been noticed, has been identified by Major Rennell and others as the *Hatra* of Ammianus Marcellinus, (lib. 25, cap. 8,) the *Atra* of Dion Cassius, (lib. 24,) and the *Hatris* of the Peutingerian tables.

This place was visited a few years ago by Dr. Ross, of the Bombay Medical Service, whose interesting memoir of it is published in the Journal of the Royal Geographical Society, and afterwards by Mr. W. F. Ainsworth, who has given a full and interesting description of it in his "Travels and Researches in Asia Minor, Mesopotamia, Chaldea, and Armenia." From the narrative of the last-mentioned gentleman, I take the liberty of introducing one or two important passages explanatory of its position and present appearances.

The following is a notice of the journey of Mr. Ainsworth and his party to *Hadhar*, from Kalah Sherkat:—"At Kalah Sherkat it was my intention to quit the river's banks, and penetrate the wilderness to Al-Hadhar, guided by the compass and Mr. Ross's map, for neither the Khawas nor the Arabs knew aught about the position of the ruins. On leaving Kalah Sherkat, we kept a little to the South of Wadi-el-Meheih, in which there was now no running water.....We travelled at a quick pace over a continuous prairie of grasses and flowering plants, and, crossing the Ain-el-Thaleb, having still a little stagnant water, we arrived at a ridge of rocks which rose above the surrounding country. From a mound, upon which were a few graves, we obtained a comprehensive view of that part of Mesopotamia which extended to the West, but without being able to distinguish the valley of the Thar-

* Geog. d'Edrisi, par Jaubert, p. 147.

thar, a brook which traverses this part of Mesopotamia, or the ruins of Al-Hadhar.....The sharp sight of the Bedwin Haji Ali was in favour of some mounds which were visible in the extreme distance to the South of West; so, having much confidence in his acquaintance with the appearance that ruins would present on the desert at such a distance, we followed these indications, but, as it turned out, fallaciously. After two hours and a quarter's quick travelling, still over prairies and undulating country, we came to the supposed ruins, which turned out to be bare hills of sandstone, the Southern termination of a low ridge.....Changing our route, we started to the North-West, in which direction we arrived, after an hour and a quarter's ride, at a valley bounded in places by rock terraces of gypsum, which indicated a wadi and a winter torrent, or actual water. To our joy, we found the Tharthar flowing along the bottom of this vale, but only from fifteen to twenty feet in width, instead of the fifty we had been led to expect; and to our great comfort the waters were very potable. The stream, though narrow, was deep, generally from five to seven feet, and hence with difficulty fordable: on its banks were a few reeds and scattered bushes of tamarisk. We proceeded up the stream, in a direction North-West, in search of a ford, which we found after one hour's slow and irregular journey, and we lost half an hour refreshing ourselves with a bath. We afterwards followed the right bank of the stream, being unwilling, as evening was coming on, to separate ourselves, unless we actually saw Al-Hadhar, from the water so necessary for ourselves and our horses.....We deemed it best to keep on up the river, but to travel a little inwards on the heights. This plan was attended with perfect success; and we had ridden only one hour and a half, when we perceived through the misty rain mounds still to the North-West, which we felt convinced were the sought-for ruins. Mr. Rassam and myself hurried on, but soon afterwards, perceiving a flock of sheep in the distance, we became aware of the presence of Arabs, who could be no other than the Shammar; so we waited for our friends, and rode all together into the kind of hollow in which Al-Hadhar is situated. Here we perceived the tents of the Bedwins extending far and wide within the ruins, and without the walls to the South-West. The ruins themselves presented a magnificent appearance, and the distance at which the tall bastions appeared to rise, as if by enchantment, out of the wilderness, filled us with wonder and surprise, no doubt in great part due not only to the splendour of the ruins, but also to the strange place where the traveller meets with them—'in *mediâ solitudine*,' as Ammianus so briefly, but so correctly expresses it."

The ruins of Hadhar, Mr. Ainsworth goes on to inform us, present the remains of a palace and temple, " surpassing, in extent and perfection, the arch of Chosroes at Ctesiphon, the residence of the Kings of Persia, of the Arsacidan dynasty."*

" It consisted," he continues, " of a series of vaulted chambers, or halls, of different sizes, all opening to the East, or towards the rising sun and planets, and regularly succeeding one another from north to south, and was divided into two parts by a wall ; while in front was another row of edifices, guard-houses, &c. &c., at the southern end of which was a great hall, with an ornamented vault and tall columns, similar to what is observed in the chief edifice. The whole of these buildings were enclosed within a wall about 1360 yards square, which left a considerable space open in front, and this open square was in the exact centre of the town, which is nearly a perfect circle, surrounded by a rampart, about 3 miles 180 yards in circumference. Portions of the curtain, which was 10 feet 3 inches in width, still remain on this rampart ; and there are also the ruins of thirty-two bastions, placed at unequal intervals. The space occupied by the town still contains the ruins of tombs, and other edifices, and is everywhere covered by mounds of ruined buildings. There is also a spring, and a channel for water, not straight, but tortuous, which crosses the town ; and there were apparently four gates, having straight roads leading from them to the central edifice. Every stone, not only in the chief building, but in the walls and bastions, and other public monuments, when not defaced by time, is marked with a character, which is, for the most part, either a Chaldaic letter or numeral.....The southerly hall, which is small, has externally every stone in the arch sculptured in high relief, with a human bust, some of which have very singular curling bag-wigs, or, more probably, a peculiar mode of dressing hair, which we know to be common in Persian sculptures, but those, I believe, only of a modern date, or more particularly of the time of the Sassanian dynasty.† The second hall is of greater dimensions, and the figures on the arch were those of angels, or females, apparently in the air, with feet crossed, and robes flying loose ; while in the interior, on both sides of the hall, were three square pilasters, surmounted by full round faces, in high relief, and executed with considerable fidelity and spirit. While the style of these sculptures appears to be pretty nearly uniform, it is impossible not to recognise costumes differing much from one

* Travels in Asia Minor, &c. vol. ii. pp. 159—162.

† But the bag-wigs, as they are here called, have also been found in the ancient Assyrian ruins near Mosul.

another. Indeed, it requires but little imagination to figure to oneself in these sculptures the representations of the successive powers who ruled the City of the Desert. The simple turban-like head-dress represents the Chaldean ; the bearded physiognomy and scattered hair, the Persian satrap ; the laurel-leaved band, supporting eagles' wings, the Roman ; while the binding round the head, like a double fold of rope, as it is also described by Mr. Ross, appears the original of the present Arab head-dress.....It may be advanced against this view of the subject, that if the building is all of one style, this style must also be carried through all its details, and that we cannot expect that any of the decorations can be illustrative of different periods ; but there is no reason why, if the Parthians or Persians borrowed their style from the Romans, they still might not have introduced their own sculpture, as at Persepolis ; or, if the Romans built the great monument of Al-Hadhar, they might equally have been influenced by a conquered people to introduce, as well as letters, forms sacred to their religion, or gratifying to their pride and to their national reminiscences. On the face of the wall of this great hall, besides the signs before mentioned, are two inscriptions, one in Chaldaic, the other in Arabic, both cut in the stones, but which run along from one to another, and are evidently more modern than the building.....The Arabic inscription was copied and translated by Mr. Rassam ; its purport is as follows :—'Mesud Ibn Maudud Ibn Tamanki, the just king, protector of religion, and defender of the faith, in humble service, and seeking mercy from his Lord, caused this to be repaired in the year of the Hejira 586.' (A. D. 1190.) This evidences the fact that Al-Hadhar was an inhabited town in the time of the Ata Beys of Mosul, for Azzud-din Mesud Ibn Maudud reigned there from A. D. 1180 to 1193 ; yet it is mentioned as deserted at the period of the retreat of Julian's army. With the assistance of lights, we examined the subterranean rooms connected with the first great hall, but did not find anything of interest. In the rear of the same great hall is another apartment, surrounded by a lofty vaulted passage. From its beautifully ornamented doorway, and complete seclusion from the other parts of the edifice, it may be conjectured to have been a religious sanctuary. Over the doorway is the most beautifully sculptured relief in the whole building ; it represents griffins supporting heads, human and others, and in the centre is the head of Apollo, or Mithra, supported by eagles, with scrolls in their mouths ; beneath is some beautifully-sculptured foliage : it is evidently of Roman execution.....At the first small hall of the Northern division, the sculptures over the arch of the entrance are among the most perfect

of the out-of-door sculptures. They appear to be alternations of male and female heads, the first having the peculiar head-dress previously noticed, while the latter present a remarkable similarity to the present style of dress in Western Europe. Some of the ladies have dresses like corsets, terminating in a point. Most of them wear tiaras of jewels; some have necklaces; and the bust is neatly and only partially displayed. The hair falls on the shoulders of some in a profusion of ringlets; in others is trimmed up in large curls, and again in some puffed out behind, as was once the case at the French court. On the wall is also the sculpture of a monstrous animal. The walls were measured, in all their details of bastions, &c., and were found to be 5460 yards round. .....Within the circuit of the walls were many ruins of doubtful character.....Some of these buildings are square, and they are of different sizes. One, ornamented with pillars, had two interior vaulted chambers, with an outer vaulted hall, and a stair leading to the top, as if to sleep upon it, as is the custom at Mosul and Baghdad. The openings to let in light are more like loopholes than windows, but this may have been for coolness, and from want of glass, as is observed in the cottages of the peasants in the East. A large square building, with one vaulted chamber, which appears to have been a small temple, or mausoleum, occurs on theNorthern side. It is built upon a handsome basement, with a projecting but simple cornice. I ought not to omit to mention that the pear-shaped cavities common in Syria are also met with amid the ruins here."*

Mr. Ainsworth has collected together some of the most important historical notices of this long-overlooked city of the desert. He says: "It is evident, from the character of the greater number of the letters and signs inscribed on the hewn stones, that the original builders were Chaldeans or Chaldees.....It is further evident that in the course of the changes which befel all the great powers in the East, that this city was ruled by Armenians, by Persians, and by Romans. According to Dion Cassius, by Xiphilinus, Trajan, after his descent of the Tigris and Euphrates, and having proclaimed Parthamaspates king at Ctesiphon, entered *Arabia*, against Atra, but want of water and provisions, with great heats, drove him away. In the time of Arsaces (Ardawan), Septimius Severus, who also returned by the Tigris from Ctesiphon, besieged this city, upon which occasion his machines were burnt by the 'Greek fire,' which appears to have been the bitumen so abundant in the neighbourhood. His men also were slain; and for want of provisions, and after twenty days' siege, the Roman emperor was forced to

* Travels in Asia Minor, &c. vol. ii. pp. 163—172.

retreat. Thus did this remarkable city, from the peculiarity of its position in the midst of a treeless desert, with one well of water and the brackish brook of the Tharthar flowing by, superadded to the skill, science, and determination of its inhabitants, successfully resist the all-conquering arms of the Romans. This period of the history of Hatra is succeeded by another interval of impenetrable obscurity. No sculpture nor monuments of any kind indicate the existence of a Christian community within its walls, which is the more remarkable as Nisibin became the seat of a patriarch, and Al Hadhar was in the centre of a newly-converted and eminently Christian people."*

Dr. Layard, in his great work on "Nineveh and its Remains," gives a brief account of a journey which he paid to Hadhar. The following is the interesting notice which he takes of the locality itself:—

"A dark thunder cloud rose behind the time-worn ruins of Al-Hather as we approached them. The sun, still throwing its rays upon the walls and palace, lighted up the yellow stones until they shined like gold.† Mr. Ross and myself, accompanied by an Arab, urged our horses onwards, that we might escape the coming storm; but it burst upon us in its fury ere we reached the palace. The lightning played through the vast buildings, the thunder re-echoed through its deserted halls, and the hail compelled us to rein up our horses, and turn our backs to the tempest. It was a fit moment to enter such ruins as these. They rose in solitary grandeur in the midst of a desert, 'in *mediâ solitudine positæ*,' as they stood fifteen centuries before, when described by the Roman historian. On my previous visit the first view I obtained of Al-Hather was perhaps no less striking..... At that time within the walls were the tents of some Shammar Arabs, but now as we crossed the confused heaps of fragments, forming a circle round the city, we saw that the place was tenantless. Flocks on a neighbouring rising ground showed, however, that Arabs were not distant. We pitched our tents in the great court-yard in front of the palace, and near the entrance to the inner inclosure. During the three days we remained amongst the ruins I had ample time to take accurate measurements, and to make plans of the various buildings still partly standing within the walls.....Suffice it to mention that the walls of the city, flanked by numerous towers, form almost a complete circle, in the

* Travels in Asia Minor, &c., vol. ii. pp. 172—174.

† The rich golden tint of the lime-stone, of which the great monuments of Syria are built, is known to every traveller in that country. The ruins of Al-Hather have the same bright colour: they look as if they had been steeped in the sunbeams.

centre of which rises the palace, an edifice of great magnificence, solidly constructed of squared stones, and elaborately sculptured with figures and ornaments. It dates probably from the reign of one of the Sassanian kings of Persia, certainly not prior to the Arsacian dynasty, *although the city itself was, I have little doubt, founded at a very early period.* The marks upon all the stones, which appear to be either a builder's sign, or to have reference to some religious observance, are found in most of the buildings of Sassanian origin in Persia, Babylonia, and Susiana."*

It will be seen from this notice, that Dr. Layard agrees with Mr. Ainsworth in ascribing a very high antiquity to this city, though he considers its most important architectural remains to be those of the Sasanidan Persian dynasty, the epoch of which was from A. D. 202 to the middle of the 6th century after Christ. Considering how early the parts of the world,—including even the deserts,—in which it is situated were peopled, we have no difficulty in supposing that it had come to its maturity long before the days of Jeremiah, about six hundred years before Christ; and that as an independent power, or as an ally of some other state, it had placed, or was about to place, itself in an attitude of hostility to the Israelites, either in their own land, or by the interruption of their commerce,—to facilitate which Solomon had built, or rebuilt, the neighbouring, and, it is to be noticed, analogous, Tadmor in the wilderness,—or by the distress of their families during the exile, so as thus to call forth the doom of the inspired prophet. Its situation is placed in Arabia by Greek and Roman writers, as is well shown in the subjoined note by Reimar, applied to the notice taken of it by Dion Cassius.†

* Layard's Nineveh, Vol. I. pp. 108—110. Dr. L. says in a note, "Many of these marks are given in Mr. Ainsworth's Memoir in the Journal of the Royal Geographical Society. They are not letters of any one particular alphabet, but they are signs of all kinds. I discovered similar marks at Bisutun, Isphahan, Shuster, and other places in Persia where Sassanian buildings appear to have existed."

† Ἐς τὴν Ἀραβίαν ἦλθε, κ. τ. λ. Arabiam intelligo quæ erat inter Euphratem et Tigrim posita. Sic infra p. 854. D. Severus in transitu per Mesopotamiam Atra aggreditur, ubi Dio tamen eam urbem Arabibus tribuit. p. 855. B. D. *Stephanus Byz.* ex Arriani lib. xvii. Parthicorum: Ἄτραι πόλις μεταξὺ Εὐφράτου καὶ Τίγρητος. Rursus autem in Λιβαναὶ, ex eodem Arriano: πόλις Συρίας ταῖς Ἄτραις γειτνιαζούσης. Sic et Abgarus Edessa regulus τῶν Ἀραβίων vocatur. Erat ergo Atra urbs Arabiæ, qua se ultra Euphratem in Mesopotamiam porrigebat, quam Arabiam Mesopotamia seu Syria describit, etiam *Xenophon* de Exp. Cyri, p. 255, velut desertam. *Herodianus* in Severo III. 9, 6. Atra refert ad εὐδαίμονα Ἀραβίαν confundens, credo, cum Ἄγρα Arabiæ Felicis,

This perfectly agrees with the indications to which we have already referred connected with KEDAR, the position of which is spoken of either definitely in connection with the Eastern desert, or indefinitely, as in "Arabia." It suits, in a striking manner, the exigencies of the passage in Jeremiah, as far as the pastoral wealth of *Hazor* in cattle and camels is concerned; for even at this day the Nomadic Arabs, particularly the Hadadin and Shamar, are abundant in its neighbourhood, with property of this character, as the nature of the country would indicate some similar wandering tribes must have probably been from time immemorial. Situated in a tolerably fertile oasis, and surrounded by deserts on all sides, its people would of old, comparatively speaking, "dwell without care," and, in many places, "have neither gates nor bars," but "dwell alone." It was within the reach of Nebuchadnezzar, the appointed instrument of its punishment and its complete destruction, as far as its people who had called down the divine vengeance are concerned, which can scarcely be said to be the case with any city of Kedar, if the country be located, as some would have it, contrary to all historical and geographical evidence, in the more remote or southern districts of Arabia. These circumstances, combined with the identity of its Arabic name, *Hadhar*, and the similarity of its Syro-Chaldaic name, *Hatra*, with the Scripture HAZOR, warrant us, I submit, to come to the conclusion that the site of the HAZOR of KEDAR, so long amissing, has now been found. The desolations of the locality, and its want of a settled population for many ages, form an ultimate state for the prophetic epoch corresponding with the language of Jeremiah:—

> "And Hazor shall be a dwelling for dragons, and a desolation for ever,
> There shall no man abide there, nor any son of man dwell in it."

On the extent of this prophetic epoch it is not necessary to say anything in this place.

quam Ælius Gallus oppugnaverat, teste *Strabone* XVI. p. 781. Certe, etiam si ultra Euphratem excurrisset Severus, tamen longe a Felici Arabia aberat, pedemque potius in Desertam tulisset. Hic apud Dionem scriptum quidem erat τοῖς Ἀγαρηνοῖς sed librariorum, puto, confusione, ex literis nata. Nam Γ et Τ sæpissime a librariis permutari multis exemplis constat, et observarit *Salmasius* ad Solin. p. 498. *b*. F. Dio sane, seu Xiphilinus eandem se dicit urbem designare quam Severus frustra oppugnavit, cujus muri partem diruit Soli dicatam, qua Atra rectius infra vocatur.—Dion. Cass. Hist. Roman. p. 1144, not. 190.

Art. II.—*Observations on the Grammatical Structure of the Vernacular Languages of India.* By the Rev. J. Stevenson, D. D.

No. 4.—The Pronoun.

Read August 1851.

The pronoun is said to be "a word used in place of a noun"; it may be questioned, however, whether words can perform their duties by deputy, and whether pronouns do nothing more than supply the place of nouns. Without such words, "designating the persons to whom and of whom we speak," we should very soon become unintelligible; and even the rudest barbarians have found such words essential for their unartificial vehicles of communication.

The pronouns, like the numerals of the vernacular languages of India, may be pretty definitely distributed, according to their origin, into the two great classes of Northern and Southern families; those of the former being mere corruptions of the Sanscrit, and those of the latter of a peculiar type, more allied to the Turanian than to the Sanscrit. The Singhalese is here also to be classed with the Northern family.

The pronoun of the first person singular offers connections which carry us over all the European and Asiatic continents. The Northern family is connected with the Sanscrit, and the languages of the centre and North West of Asia, and the whole of Europe. The Southern is allied to the languages of Arabia and Syria, on the one hand, and on the other with the Chinese family.

Each of these, again, is divided into two subdivisions, which, however, seem rather to have been the result of accident than of any deep-seated analogies. The following tables will illustrate these positions:—

I.—Connections of the North-Indian Family.

1st.—Words for *I*, connected with *Aham*, the Sanscrit Nominative :—

Sanscrit.	Persian of the Behistun Inscriptions.	Pehlavi.	Gujaráthi.	Cashmerian.	Sclavonian.	Yenissean* (in Siberia).	Spanish.	Greek and Latin.	Portuguese.	Danish.	French.	German.	Dutch.	English.
Aham	Adam	Afum	Hun	Boh	As	Ya	Yo	Ego	Eu	Ei	Je	Ich	Ik	I

2nd.—Words for *I*, connected with the Sanscrit Accusative *Má* :—

Modern Persian.	Singhalese.	Hindi.	Maráthi.	Bengáli.	Uriya.	French.	Italian.	Celtic.	Scindian.
Man	Mama	Main	Mí	Múi	Mú	Moi	Mi	Mi	Mán

II.—Connections of the South-Indian Family.

1st.—Connections of the Ancient Canarese *A'n* :—

Ancient Canarese.	Ancient Tamil.	Modern Tamil.	Modern Canarese.	Telugu.	Kurgi.	Todava.	Tuluva.	Totenge,† in Assam.	Lar, in Scinde.	Chaldee & Arabic.	Hebrew.	Syriac	Central Indian Hill Tribes.‡ Uráon.	Rajamahali.	Gondi
A'n	Yán	Nán	Nánu	Nenu	Nán	A'n	En	Ne	Awn	Ana	Ani	Eno	Enan	En	Mani

2nd.—Connections of the Malyálim Nyán :—

Malyálim.	Tibetan.	Kamschatkan.*	Burmese.	Armenanese.	Hákot and Khot, in Assam.	Malapa,† in Assam.	Chinese.	Singhbum Kol.‡	Sontal Hill Tribe.‡	Mundala Hill Tribe.‡
Nyán	Nga	Ganny	Nga	Nga	Ngú	Ngai	Ngo	Aing	Inge	Ing

* The words thus marked are taken from Klaproth's "Asia Polyglotta."

† The words thus marked are from a valuable paper in the Calcutta Asiatic Society's Journal, by Mr. Robertson.

‡ The words of the Hill Tribes are from Mr. Hodgson's Collections.

From this table it appears—

1st, That the ancient aboriginal pronoun of the first person singular has been lost out of the Northern family nearly altogether, and corruptions of the Sanscrit substituted. One solitary connection between the ancient Canarese and a Scindian dialect remains to attest any relation between the Northern and Southern families.

2nd, That the old pronoun in a modified form still keeps its place in the dialects of several of the Hill tribes.

3rd, That it has a connection on the one hand with the Syro-Arabic family, and on the other with the Tibetan and Chinese.

In taking a survey of the other pronouns, similar but less striking coincidences occur. The Twam of the Sanscrit in the softened forms of tu, tu*n*, tue*n*, &c., pervades the Northern family, and the *Ni* of the Tamil the Southern and Hill tribes, as the following table will show.

Forms of the singular of the pronoun of the 2nd person :—

Tamil.	Malyalim.	Telugu.	Canarese.	Kurgi.	Todava.	Uráon.	Rajamáhali.
Ni	Ni	Nivu	Ninu	Nin	Ni	Nin	Nin

In reference to the pronoun of the 3rd person, we may remark that wah or wo of the Hindí comes nearer the awan of the Tamil, and some other Southern languages, as well as the (هو) hu of the Arabic, the kho of the Tibetan, and the (و and ول) o and ol of the Turkish, than the (स :) sa*h* of the Sanscrit.

One of the striking peculiarities of the Indian pronouns is the class of honorific pronouns, which pervades them all more or less.

In the Southern family, including the Singhalese, and in the Bengáli and Uriya of the Northern family, we have a regular singular form, honorific form, and plural form, for the personal pronouns. In the rest of the Northern family, one word, the *A'p* of the Hindí, *A'pun* of the Marathi, &c. stands for them all. These words, indeed, are translated *self*, yet they are not used like our word *self*, with other personal pronouns, but as a substitute for them, and usually to denote honor or respect, and cannot be translated by any one English word. They are often used where we would say *Your Majesty*, *Your Honor*, &c. The भवान *Bhaván* of the Sanscrit is used much in the same way, but it seems easier to derive the word (आपन) *Apan*, the original in the vernaculars, from the Tamil Avan, by the common change of *v* into *p*, than from any other source. This system of using honorific pronouns connects the Indian languages with the Tibetan, Chinese, Japanase, Indo-Chinese languages, and the dialects of the Central Indian Hill tribes, especially of the Sontals.

There is a most singular idiom mentioned in the Tamil, Malayálim, Telugu, Maráthi, and Gujaráthi grammars, as pervading all those languages, and I strongly suspect not confined to them. It is a double pronoun, of the first person plural, the one form taking in the whole of the persons present, and the other only one party, if there be more parties than one. In these tongues the common plural is used to designate the plurality of a party, and the honorific pronoun to include the whole assembly. Thus, the Tamil Nánggal means *we* of the one party as opposed to you of the other, while the honorific *Nám* takes in all parties present. In the Gujarathi, *Hame* is we of the one party, and *Apane* is we including the whole company ; and so of the others above mentioned. A rather laughable instance of the danger of neglecting this distinction, (a mistake so frequently made by foreigners,) I once witnessed in a European, who was addressing a company of natives in their own language. He, while uttering some truths which he meant to apply to mankind in general, used the wrong *we*. A native immediately retorted, "True, that is *your* character ; but *ours* is very different." This characteristic, be it noticed, we have traced by these five languages in one continuous line from Cape Comorin to the Indus; and it is not likely such a singular idiom could have got into all these tongues by accident, or have been borrowed from one by the others in modern times ; and it is not a Sanscrit idiom.

Another singular coincidence between the Tamil and Gujarathi exists in the use of the particle A′ (अ) as a demonstrative pronoun. This particle is also used in the same sense in some other of the Southern tongues, and connected with it in other Northern languages, we may reckon the Maráthi Há, hí, he*n* ; the Singhalese and Bengáli E ; the Scindian He ; the Panjabi Eh, and even the Hindostáni Yih.

In the Northern family, relative pronouns generally follow the rule of the Sanscrit, and are but corruptions of the Sanscrit (यः) Ya*h*. This pronoun would more accurately be translated by *whoever*, or in Latin by *quicunque*, than by *who* and *qui*, or in other connections by *what*. In the Southern tongues, again, there is no relative, and its want is usually made up by the participial termination. Even in the Northern family this is allowable ; and, moreover, the relative is rarely supplied in familiar discourse, while the demonstrative pronoun, which is sometimes called a co-relative, must never be omitted, whether the relative be used or not. A common Hindu would rather say *Chori kiyí wuhi hai*, than *Jo chori*, &c. although the latter be the form generally used in books, and by the learned. No one, however, would

use such a phrase as the following : "The man who was here yesterday is come again to-day." The demonstrative pronoun *he*, which we omit before "is come," is essential to a Hindu; while the *who*, which is essential to us, is indifferent to him.

The cases of pronouns are formed much in the same way as those of nouns, as will be seen from the example we give below of the declension of the pronoun of the second person. There is, however, one striking connection between the Northern and Southern families, which comes out chiefly in the pronouns. It is the relation that subsists between the *re* of the genitive in the Hindí and several of the other languages, and *rhe* in the Malyálim. This latter is evidently the original, as the harsh *rh* used does not belong to the Sanscrit, or to any of the Northern tongues. The Northern form, then, is evidently a softening of the original Southern syllable. It may be worth while, also, in passing, to notice the coincidences pointed out before between the termination of the dative in so many of the Southern and Northern families, and those of the accusative in a few of them; all of which are entirely independent of any Sanscrit influence.

I think, then, we have traced in several instances a thread of connection, though often but a slender one, running through the Northern and Southern families, and showing the influence on all, more or less, of an ancient aboriginal tongue, entirely different from the language of the Brahmans.

As illustrations of the subject in hand, the two following tables, the former showing the inflexions of the pronoun of the second person in some of the hill-tribe dialects, and the second the same in the languages of the plains, will be found worthy of attention. The two first are from Hodgson's papers, and the three last from Robinson's, in the Journal of the Asiatic Society of Bengal.

PRONOUN OF THE 2ND PERSON IN THE DIALECTS OF THE HILL-TRIBES.

	Nom.	*Gen.*	*Dat.*	*Acc.*	*Ins.*	*Loc.*
			SINGULAR.			
Bodo	Nang	Nang-ni	-no	-kho	-jang	-now
Dhimal	Ná	Nánq-ko	Neng	Neng	Nang-dong	Nánq-ta
Garo	Náá	Nangni	-na	-kho	-chi	-o
Káchári	Nang	-ni	-no	-kho	-jang	-niáo
Miri	No	Nogke	-kepe	Nom	-koki	-lo
			PLURAL.			
Bodo	Nangchur	-ni	-no	-kho	-jong	-noa
Dhimal	Nyel	Ningko	-eng	-eng	-dong	-ta
Garo	Nasimong	-ni	-na	-kho	-chi	-o
Káchári	Nangsur	-ni	-no	-kho	-nijang	-niáo
Miri	Nólu	-g	-kepe	Nolum	-koki	-lo

INFLEXIONS OF THE PRONOUN OF THE SECOND PERSON.

Inflexions of the Singular Number.

	Sanscrit.	*Hindi.*	*Panjábi.*	*Gujaráthi.*	*Maráthi.*	*Singhalese.*	*Sindian.*	*Bengáli.*	*Uriya.*	*Telinga.*	*Canarese.*	*Támil.*	*Malyálim.*
NOMINATIVE—	Tvam	Tu*n*	Tu*n*	Tú*n*	Tú*n*	To	Tu*n*	Túi	Tú	Nivu	Ninu	Niya	Ni
GENITIVE—	Tava *or* Te	Tere	Tere	Tahárun	Tuzhe*n*	Tage	Tojo	Tora	Tora	Niyokka	Ninna	Unadu	Ninrhe*
DATIVE—	Tubhyam	Tujhko	Tainúm	Tane	Tula	Tata	Tokhe	Tore	Tote	Niku	Ninnge	Unaka	Nannikka
ACCUSATIVE—	Tvám	Tujhe	Tainúm	Tane	Tula-te	Ta	Tokhe	Toke	Tote	Ninna	Ninnanu	Unanai	Ninne
INSTRUMENTAL—	Tvayá	Tune	Taina	Tue	Tvá		To	Tote	Tore	Nicheta	Ninninda	Unnál	Ninnál
LOCATIVE—	Tvayi									Nilo	Ninnil	Unnanil	Ninnalli

Inflexions of the Plural.

NOMINATIVE—	Yuyam	Tum	Túsin	Tame	Tumhi	Topi	Tahin	Tomará	Tumbhamáni	Miru	Nivu	Ninggal	Ningngal
GENITIVE—	Yushmákum	Tumáre	Tuhádá	Tamárún	Tumatsen	Tope	Tahan	Tomádigera	Tumbhamáningkara	Miyokka	Nimma	Unggal	Ningngate
DATIVE—	Yushmábhyam	Tumko	Tuhánúm	Tamne	Tumhálá	Topata	Tahánkhe	Tomadigere	——————ku	Miku	Nimnge	Unggalaku	Ningngalkku
ACCUSATIVE—	Yushmán	Tumhe	Tuhánúm	Tamne	Tumhás	Topa	Tahankhe	Tomádigke	——————ku	Mimmu	Nimanna	Unggalai	Ningngale
INSTRUMENTAL—	Yushmabhi*h*	Tumne	Tusin	Tamoe	Tumbin		Tahán	Tomádigete	——————re	Micheta	Niminda	Unggalál	Ningngát
LOCATIVE—	Yusmásu									Milo	Nimalli	Unggalil	Ningngalil

* Generally pronounced *Ninde*.

Art. III.—*Memoir on the Geology of the South-East Coast of Arabia.* By H. J. Carter, Esq., Bombay Medical Service, formerly Surgeon of the H. C. Surveying Brig "Palinurus."

Presented October 1851.

The matter contained in this "Memoir" was chiefly collected during the late Surveys of the South-east Coast of Arabia, by Captain Sanders* and Lieut. Grieve, I. N.; much has been contributed by Lieut. Grieve, who latterly had sole charge of the Survey, through specimens and information of parts which I had not an opportunity of examining; and the geology of the Curiyah Muriyah Islands is extracted from the late Dr. Hulton's interesting account of them, taken during the time they were surveyed by Capt. Haines, I. N., now Political Agent at Aden.

Previous to entering on the subject of this "Memoir," I shall premise a few general remarks on the outline of the coasts about to come before us more in detail: this will be followed by a running geological description of them, made more particular where they were actually examined; and, finally, a short review of all the facts which have been brought forward.

Although I have only mentioned the South-east Coast of Arabia, I shall begin from the Straits of the Persian Gulf, follow the South-eastern Coast and its islands to the Straits of Bāb el Mandeb, and then, crossing over to Berbera, pursue the African Coast from this point, with its islands, to Socotra. I have not much to offer of the former or latter coasts, but what little I have will, I think, be found interesting, in connection with the South-east Coast of Arabia.

Beginning, then, from Ras Măssăndăm, which is the name of the western promontory of the Straits of the Persian Gulf: the mountains which form this have been fretted into innumerable irregularities, and rapidly rise from 400 feet, which is the height of the small island called Măssăndăm, at the extremity of the Cape, to 2000, then 3000, and

* It is but due to state, to the memory of this able surveyor and excellent officer, who died at sea near Malta on the 14th August last, that I received the greatest kindness from him during the time I had the good fortune to be under his command.

subsequently, as they progress in a semi-circular direction, south-eastward, to 6000 feet above the level of the sea, which they are at a point some miles inland opposite Máskat; leaving in their course a comparatively flat country between their lower hills and the sea, which is called Bātănă. This flat country extends to within fourteen miles of Máskat, after which the land, which is raised up into a confusion of ridges and hills, with scarped precipices, presents an irregular sea-cliff on to the neighbourhood of the Devil's Gap; and inland a succession of elevations, which end in the ridge just mentioned. This ridge, which is about forty miles from the sea opposite Máskat, is, as before stated, about 6000 feet high, and goes by the name of Jibal Fállah. Proceeding southwards, it gradually approaches the coast, and terminates at the Devil's Gap, of which it forms the northern boundary: it is there 6228 feet high.* The Devil's Gap is the outlet of a great valley, which ramifies up among the mountains of Oman. From its southern boundary another ridge arises, which attains a height of 4400 feet† within eight miles of the sea, and descends to the latter in two or three precipitous cliffs. This ridge is continued on south-eastwards, to terminate in Jibal Jallān, which is about 3900 feet high,‡ and about twenty miles inland from the south-eastern coast: it is the southern extremity of the great mountainous chain of Eastern Arabia. From its eastern side a group of mountains extend towards Ras el Hăd, or the eastern extremity of Arabia, to which we shall come presently, and its subsidence in the other directions will be mentioned by-and-bye.

The eastern extremity of Arabia, commonly called Ras el Hăd, is truncated, and presents a coast facing due east, about twenty miles in extent. This is accompanied by a sea-cliff about one hundred feet high, which is about the general level of the land here.

Turning this extremity to the south-west, we get no more sea-cliff for a great distance, and after passing opposite the termination of the great chain to which I have alluded, the land soon subsides to a general level of from 50 to 100 feet above that of the sea, without any mountains interiorly, or towards the south-west, but presenting a continuity of low undulating hills, of a sandy-looking aspect, and a light brown colour, as far as the eye can reach. This continues on to opposite the island of Masira, where the mainland sinks to the level of the sea, the only place on the coast where this occurs unbacked by mountains.

The island of Masira, which is opposite this port, is rocky and mountainous, and in its highest part not more than 600 feet above the level of the sea.

* Chart; Lieut. Grieve. † Idem. ‡ Idem.

After Masira, the mainland begins to rise again, and a sea-cliff first commences at a Cape called Ras Kăbret, in 19° 57′ N. lat. and 57° 48′ E. long. The land, however, on the western side of the bay, called Ghobat Hăshish, which is a little to the north of Ras Kăbret, is 80 feet above the sea,* and goes on increasing in height, until it attains an altitude of 480 feet† at Ras Markās, which is close to Ras Jăzirăh. On account of the coast here running north and south for 100 miles, and therefore cutting its general direction, which is N. E. and S. W., at an angle of 45°, we not only see that the land rises towards the S. W., but that it rises also towards the south.

From Ras Jăzirăh onwards, the coast gradually increases in height to 800 feet, which it is about the centre of Curiyah Muriyah Bay; and in its first part is, from its height and whiteness, very similar to the cliffs between the North Foreland and Beachy Head. But as we approach the south-western horn of Curiyah Muriyah Bay, its outline and horizontality become disturbed, and suddenly it attains a height of 4000 feet, which it preserves, more or less, on to the Yaffai mountains, at the Straits of Bāb el Mandeb.

Opposite Curiyah Muriyah Bay are five small islands, which in point of size are hardly more than the tops of so many mountains. They are about twenty miles off shore, and the largest and highest, which is Hăllăniyah, has a point 1645 feet above the level of the sea. There are also two or three still smaller opposite Hisn Ghorab, about sixty miles south-west of Makalla.

The chief features of the land between Curiyah Muriyah Bay and the Straits of Bāb el Mandeb are, that here and there it is more or less tabular in its outline; more or less broken into mountainous peaks; more or less interrupted by ravines; five times by great valleys; and once (in the Bay of El Kămmăr) by an intervening tract of low land forty to fifty miles in breadth, which, running S. W. and N. E., seems to cause a natural division into two parts of the mountainous ridges of which this elevated tract is composed. Throughout, this high land is more or less scarped upon the sea or the maritime plain, which latter is seldom more than ten miles in breadth.

Its color is for the most part white, particularly where it is weather-worn, and here and there black or brown, where it is confronted by, or mixed with, rocks of an igneous origin.

Having thus given a brief outline of a part of the North-east and the South-east Coasts of Arabia, let us now proceed to the composition of their rocks.

* Lieut. Grieve. † Idem.

Returning to Ras Mässandam, which, as before stated, is the western promontory of the Straits of the Persian Gulf, and the northern extremity of the chain of mountains which extends along the North-eastern Coast of Arabia from the Cape just mentioned to the neighbourhood of Ras el Had, we find this promontory, taken generally, to be mountainous, and fretted out into innumerable irregularities, which have given rise to the formation of as many coves, creeks, inlets, islands, islets, and rocks. Ras Mässandam, the extremity of an island by the same name, is 400 feet high, and the next portion of the Cape is about 1500 feet, and but a few miles further inland these mountains rise to 3000 feet. At first sight they no doubt appear like black basalt, from their color, and hence have been described as such by Captains Wellsted and Whitelock, and have always been considered igneous rocks. Pliny calls them the Eblætian mountains, probably from the Arabic *iblis*, the devil; but latterly this promontory and its islands have been inspected by Lieut. Constable, of the Indian Navy, who has kindly shown me rock specimens from them, which prove that they are all composed, not of black basalt, as before suspected, but of jet black and dark black grey limestone, interstratified and veined with white and pinkish brown calc-spar. The jet black limestone is of a fine compact structure, and breaks with a smooth conchoidal fracture, like lithographic limestone, but the lighter colored varieties are more coarse, and break with a rough fracture. The calc-spar, which is in strata of eight to ten feet thick, is columnar, or vertical, in its crystallization, and traversed horizontally by wavy lines, like that from Gibraltar: some of it is of a dazzling whiteness, and of a massive saccharoid crystalline structure. I was informed by Lieut. Constable that the whole of these mountains here are of a similar composition, and that they are horizontally stratified, the strata in some places being thinner and more schistose than in others.

Proceeding southwards, this chain of mountains, as I have already stated, curves inland, and leaves a low country in front of it, called Bätänä, which is without sea-cliff, on to a point fourteen miles north of Mäskat. It is from this point that my own observations commence. To the north of it, as far as the eye can reach from an elevation of 600 feet, nothing is seen but a low shore, shelving up very gradually to the mountains inland, each shelf presenting a scarped surface, possessing a chalky appearance, which gives a general whiteness to the whole district, and from which I inferred that it was but a continuation of the same limestone formation as that of the sea-cliff on which I was standing when I made these remarks.

This limestone formation, as it occurs in the vicinity of Mäskat, I

have already described in our Journal;* but for the sake of not breaking the continuity of the present description, I will repeat a paragraph or two of it here, leaving the reader to go to the paper itself for further information on the subject, which it would be as well that he should do at once, if possible, as he will there find, in the geological description of the neighbourhood of Mâskat, an account of the limestone formation in this locality, and a description of the different igneous rocks which have come to the earth's surface in this part of Arabia, all more or less typical of what we shall hereafter frequently meet with on the south-eastern coast.

In summing up the few observations contained in the paper to which I have alluded, it is stated, p. 125,

"That the limestone formation, limiting the group of igneous rocks at Mâskat, both north and south, commences (from below upwards) with a deposit of the same kind of pebbles (viz. coarse and fine-grained diorites, basalts, petrosilex and quartzites), lying in both places on the fundamental rock of the locality; passing into a sandy grit; then into a silico-calcareous deposit; then presenting the remains of marine animals, (small ostreiform Gryphæa,) these increasing in number with the calcareous material (chiefly consisting of minute and small Foraminifera); the increasing purity of the limestone, interrupted in each instance by a pink-colored deposit, that at Ras Ghissa (south of Mâskat) chiefly consisting of the remains of small Foraminifera, and that of the formation at Darzit (north of Mâskat) of a thin series of gypseous, marly, and arenaceous strata; then a compact yellowish or fawn-colored limestone (presenting a variety of shells and corals), terminating the series at both places, and almost entirely composed of the accumulated remains of polythalamous animals."

The following are the fossils which I found in this formation, and which I shall insert here, as they are not mentioned in the paper to which I have referred:—

FORAMINIFERA.

Nummularia.— *N. obtusa.* Sow. (Pl. xxiv. fig. 14, Grant's Geol. Cutch. Geol. Trans. Vol. VI. 4to.) *Loc.* Mâskat. *Obs.*—The specimen containing these nummulites was brought to me by the late Capt. Newbold, who saw a bed of them in the limestone formation at Mâskat. I cannot say from what part of the series it came, but the fact is sufficient to prove that this formation, if not the whole, is a part of the "Nummulitic Series."

* Vol. III. No. xiii. p. 118.

Operculina, d'Orb.— *Species?* Test white, porcelainic, sub-circular, equilateral. The largest about $\frac{1}{16}$ inch in diameter. Consisting of three whorls, each whorl thickened on the external edge; spire irregular, chambers numerous, increasing regularly from a central cell projecting on both sides; the divisions of the chambers distinct externally. *Loc.* Mäskat. *Obs.*—This species abounds in the silico-calcareous sandy part of the formation of Mäskat, just before the latter passes into compact limestone. It is now, even, common on the South-east Coast of Arabia, and exists in a large bed, mixed with fine sand, in twenty-five fathoms of water, opposite the village of Takah. Other fossilized species of Operculina occur with it at Mäskat, even so low down as the grit where the first organic remains begin to appear.

ECHINODERMATA.

Spatangus.— *Species?* Subovate. Length $1\frac{4}{17}$ inch, breadth $1\frac{2}{17}$ inch, thickness $\frac{9}{17}$ inch. Notched anteriorly, truncated and overhanging posteriorly, with the vent in the upper part, from which a ridge extends on to the genital pores. Ambulacra four, sunk in grooves, slightly truncated, the two posterior shorter than the two anterior ones. Base sub-carinated in the centre, mouth bilabiate, near the margin. *Loc.* Mäskat. *Obs.*—From the pink stratum which abounds with the Operculina above mentioned.

ZOOPHYTA.

Caryophillia.— *C. cornigera?* Lam. *Loc.* Mäskat. *Obs.*—This species is very like *C. Anthophyllum*, (Lam. et Ellis, Tab. 29,) but has rounded extremities and contracted stellæ at the ends of them.

Agarica, Meandrina, Astrea, and Scyphia (Goldf.).

CONCHIFERA.

Gryphæa.— *Species?* (Cast of lower valve, imperfect.) Length $1\frac{6}{17}$ inch, breadth $1\frac{3}{17}$ inch. Deeply carinated; irregular, wavy, or lobed towards the circumference, and expanded, particularly towards the right side. *Loc.* Lower sandy part of aqueous strata, Mäskat.

——— 2d *Species?* (Lower valve, incomplete.) Length $1\frac{2}{17}$ inch, breadth $\frac{3}{4}$ inch. Deeply carinated, expanded, plane towards the circumference; smooth externally, presenting concentric striæ; uncinated, like *O. Uncinata* Desh. (Coq. For. Envir. de Paris, Tome 1, Tab. 18, Figs. 7—11.) *Loc.* Mäskat. *Obs.*—This and the foregoing species abound together, and are more or less ostreiform.

GASTEROPODA.

Natica.— *Species?* (Cast, incomplete.) About 2 inches long. First and second whorls depressed. *Loc.* Mäskat. *Obs.*—Imbedded in a

yellow calcareous stratum, or granular deposit, consisting of minute Foraminifera.

The limestone forming the upper part of this formation, north of Măskat, is much more pure and compact than any that I arrived at in tracing the strata from below upwards on the south side of this town; and, from the distance of the top of the formation from the fundamental rock in the former situation being much greater than in the latter, I am inclined to think that the section I took on the south side of Măskat was incomplete, and that the upper compact strata had there disappeared.

From the sandy nature of the deposits in which the small Foraminifera abound in this formation, and the sandy base of the genuine specimen of nummulitic rock which the late Captain Newbold found at Măskat, as well as from the loose silico-calcareous or calcareous sand in which all the nummulites I have ever seen, from Egypt, Sindh, and Cutch, have been imbedded, I am of opinion that this is the part of the Nummulitic Series in which their remains are to be sought, and not so much in the compact and purer limestone above, where I had always fancied they were to be found; and when, in connection with this, I consider that the bed of Operculina already mentioned, opposite Takah, which contains the largest living specimens of Foraminifera I have met with, is mixed with fine sand, and that I have always observed their tests to be more numerous in sandy bottoms than in more subtle and plastic deposits, I am not so surprised that these delicate shells should not occur in the finer material of which the compact limestone of the Nummulitic Series is more or less composed, and where I had expected most to find them.

Passing on from the commencement of the sea-cliff at the end of the plain of Bātănă, to the town of Măskat, we soon step from the limestone formation, here all at once raised to 600 feet above the sea, on to the bed of igneous rocks, in the midst of which Măskat is situated.

These are spread over an area of about ten miles long, and three miles broad, and are chiefly composed of serpentine, which is limited on the coast, and inland by a yellow-colored limestone formation, (the one just mentioned). Their ridges and summits are sharp and peaked, and seldom exceed 400 feet in height, and their sides and valleys soilless and barren.

"The serpentine is for the most part of a dark brown colour, and interspersed with small laminated crystals of diallage *chatoyante*. When taken from a depth, it is tough, and not easily broken; but on

the surface crumbles and breaks into rectangular fragments, the sides of which are more or less coated with green and variegated serpentine, steatite, or calcareous spar. In some parts it is of a light brown color, and earthy, while in others it is darker, more compact, and more waxy or crystalline. It is exactly the same as that of the Lizard Point, in Cornwall."

Here I must correct a misapplication of terms; the "serpentine," following Brongniart's "Classification et Caractères Minéralogiques des Roches,"* should have been termed "euphotide." It presents the same varieties as that of St. Kevern, and the Lizard, in Cornwall, viz. Euphotide felspathique, and E. ophiteux (Bt.), that is, a rock composed of compact felspar, with isolated crystals of diallage, more or less serpentiniferous, just as diorite (Bt.), with which we shall presently see it is connected, is composed of two ingredients, viz. felspar and hornblende.

The northern extremity of these igneous rocks is composed of diorite, and the limestone formation rests upon it, while between the diorite and the euphotide is a bed of green steatitic clay, out of which oil jars, water jars, &c. are manufactured.

Passing over these igneous rocks to the limestone cape called Ras Ghissa, which limits them to the south of Măskat, we follow the coast from this point on to the cape called Ras el Hăd, at the eastern extremity of Arabia, and of this part I know nothing further than what I have frequently seen from the sea, and what Lieut. Grieve, who surveyed it, has kindly communicated to me.

From Ras Ghissa the limestone formation is continued on for thirty or more miles in an extremely broken condition, being raised in ridges one after another, having their white fractured surfaces towards the north-east, and their original surfaces sloping in the opposite direction; consequently the sea-cliff which faces them is also extremely irregular. After the distance mentioned, the formation loses its ridge-like character, and passes into round and isolated hills, and the great inland ridge approaches the sea to form the northern boundary of the Devil's Gap, which, as before stated, is 6223 feet above its level. There is here a break, and no cliff for a few miles, until the ridge, which forms the opposite or southern boundary of the opening of the valley, commences, and this, attaining a height of 4400 feet not above eight miles from the sea, presents, as may be conceived, an immense mural surface in this direction.

From the summit of the ridge here, which is called Jibal Jăbăr, the

* See Dict. des Sciences Naturelles, Art. "Roches."

land descends to the sea in two or three gigantic cliffs, and is thus scarped the whole way to the town of Soor, where the coast line, turning still more to the east, leaves the scarped ridge to pursue its course southwards, and terminate in the mountains of Jallān. Lieut. Grieve states (Priv. MS.) that "the Jibal Beni Jābăr rise abruptly from the sea to a height of about 3000 feet," near a deep narrow valley called Wadi Shāb, about thirty miles N. W. by W. of Ras el Hăd. Specimens from this valley show that this mountainous ridge is composed of limestone, like that of the other parts of the coast. Its scarped bared surface presents a horizontal stratification, and a general light brick-red color, which is the prevailing tint of the limestone formation throughout the whole coast of Southern Arabia, and arises from the presence of more or less red argillaceous earth, which is found in the cavities of the rock, and about the organic remains. When the rock weathers down to these cavities, the earth becomes liberated, and, spreading over the white limestone, gives it the tint mentioned. In some parts it has entered into the composition of the rock itself, which then is of a cream color. Opposite the scarped surface of Jibal Jābăr there are no soundings half a mile off shore, and this is invariably the case on this and the south-eastern coast, where the land rises abruptly from the sea. Wherever it is highest the soundings are deepest, and *vice versâ*.

From the town of Soor to Ras el Hăd, the coast presents a sea-cliff of about 70 feet high, with land rising in shore to 200 feet, but sinking gradually towards the eastward to the level of the sea, which it attains at Ras el Hăd; also several great irregularities along the coast, which have evidently been occasioned by subterraneous influence.

Lieutenant Grieve mentions a singular pit on the top of the cliffs two miles east of Soor, which is 80 yards in diameter, and 60 feet deep; and it is only a few months since that an earthquake took place near Soor, which shook down several houses there. After this pit, come two other similar, but much more extensive depressions, viz. the Khors or Lagoons of Jărāmah and Hăjar. The former, entering by a narrow channel from the sea, is three miles long and two broad, with sides of 50 to 70 feet high, and water ten fathoms deep, making in all a depth of 110 to 130 feet below the level of the surrounding land. Khor Hăjar, which follows this, is not more than half the size, and much more shallow, but of the same kind of depression.

Rock-specimens from the top of the cliffs about two miles from Soor, near the great pit, which were kindly sent me by Lieutenant Grieve, show that they are composed of a fine white saccharoid limestone, which

has undergone minute fracture, and has had its fissures filled up again by a red colored cement, probably of the same composition as the parent rock. Such a brecciated state is frequently seen on the south-eastern coast, and in all probability has been caused by the shock of some subterraneous explosion or upheaval. At the same time, I have noticed that such rocks are more or less magnesian: the one just mentioned, on a rough analysis, yields about 12.18 per cent. of magnesia, and hardly effervesces at all with acids before it is pulverized. Its Sp. Gr. is 2.72. The specimens from the lower strata of the same cliffs show that they have not been fractured in the same manner, though of the same composition and structure. I think I have also noticed on this coast that the upper strata are those which are most comminutely fractured, while the lower ones are less so, or have escaped it altogether.

The rock-specimens from the sides of Khor Järämah are of a coarser structure; and when we arrive at Khor Häjar, where the cliffs sink to the level of the sea, and are lost under the sand of the plain, there we find them composed of a limestone conglomerate, consisting of pebbles of the older formations, and shells, cemented together by a red calcareous sand, in which there are minute particles of igneous rocks. In some parts, this cement exists as a rock by itself, without the grosser portions, and appears to belong to a loose miliolitic formation, which we shall find by-and-bye to prevail on the south-eastern coast.

At Ras el Häd, which is a sandy cape, we have a plain of two or three miles square, connected on its western side with the Khor last mentioned, and on its eastern side forming the northern point of that short piece of coast which, running north and south for twenty miles, terminates the eastern extremity of Arabia. This short eastern face presents a uniform limestone cliff 100 feet high, and of a light yellowish color, with horizontal strata. Specimens from it show that it is composed above of a compact yellow limestone, breaking with a sub-conchoidal, uneven fracture, almost identical with that from the cliffs of Kurachi opposite; also of strata of the same kind of material and structure, containing abundance of small Foraminifera; and a stratum of whitish saccharoid limestone, like that mentioned at the base of the cliffs two miles east of Soor; while another specimen from these cliffs shows that there is a stratum of the kind last alluded to, which contains a considerable quantity of hyaline quartz, in minute grains, indeed an arenaceous limestone; it resembles the fine silico-calcareous strata of the limestone formation at Mäskat.

Turning Ras el Khubba, which is the south point of this short piece of coast, we come upon the South-east Coast of Arabia, and lose all sea-

cliff for upwards of 180 miles. The coast now generally runs N. E. and S. W., and presents nothing but a sandy shore for the distance I have mentioned, and which I will now more particularly describe.

The first thing worthy of notice on proceeding along this coast is a little cape called Ras Rues, which consists of a few hillocks about twelve feet high; this is about three miles from Ras el Khubba. These hillocks are composed of a recent conglomerate, the grosser parts of which are held together by a dirty-looking silico-calcareous sea-sand, and though exceedingly insignificant in appearance, nevertheless they are interesting in a geological point of view, inasmuch as they contain pebbles of all the rocks probably in the neighbourhood. These pebbles consist of diorites, basalt, quartzite, jasper, and portions of the older limestone formation, all smoothly rounded by attrition.

After leaving this cape, and passing along the coast, we arrive opposite the mountains of Jallān, which I have already stated to be the termination southward of the great chain on this side of Arabia. They are about twenty miles inland from the south-east coast, and the highest is about 3900 feet above the sea. On every side, viz. towards Ras el Hăd on the east, and the desert of Akhāf on the west, as well as towards the south-eastern coast, they, like other mountainous terminations, subside more or less gradually, and more or less irregularly, to the general level of the surrounding country. This, towards Ras el Hăd, or the eastern extremity of Arabia, is in coin-shaped mountains, which offer beautiful scarps for the geologist, and are easy of access; towards the south, in low conical or dome-shaped hills of a brown sandy aspect, mixed with dark peaks, probably of igneous matter, such as we shall see a little further on; while towards the west the subsidence is more gradual and regular, to hills of about 200 feet high. Mr. Cole, of the Indian Navy, who travelled from Laskhara, a town on the coast just here, to Măskat, along the western side of these mountains, kindly sent me specimens from the hills near Bădiyah, which town is in the same parallel of latitude as the highest of the Jallān mountains. These specimens show that the same kind of black limestone exists there as that which Lieut. Constable showed me from Ras Măssăndăm; also pieces of fine compact grey lithographic limestone; and of fine argillaceous slate, of blue and black colors. Hence we may infer that the black limestone forms part of the mountains of Oman, both north and south, but whether continuous or isolated remains for future observation to determine.

Some distance after the subsidence of the mountainous chain has taken place towards the eastern extremity of Arabia, and the land in

this direction has assumed a general level of from one to two hundred feet above the sea, two mountains, close together, and of equal height, being about 855 feet above the plain, make their appearance. These, which are called Jibal Saffān, are close to the cliff of the eastern extremity of Arabia, and of course isolated for some distance from any other mountains. They are, therefore, very remarkable, from their situation, and being coin-shaped, presenting their fractured surfaces towards the west; they also form a fine section, which is easily attainable, so far as it goes, of the strata at this point; the sea-cliff, as I have before stated, being only 100 feet high.

From Ras Rues onward we have no cliff, and nothing on the land remarkable, beyond the low, brown, sandy-looking hills, and isolated dark peaks, dispersed here and there among them, until we arrive at a place called Ras Jibsh, which only differs from the rest of the coast in presenting a few of these dark peaks, which are arranged in a ridge-like form about 100 feet high, made more evident by their being a little above the surrounding country. There are now no longer any mountains to be seen inland, and nothing more than a monotonous extent of brown sandy-looking mounds, from 50 to 100 feet above the level of the sea, as far as the eye can reach in every direction.

The dark igneous peaks which form the cape called Ras Jibsh are probably only a repetition of what we have before seen among the sandy hills, and they are composed of euphotide and diorite, as those at Mäskat. The diorite, however, presents larger crystals of hornblende, which occurs here in a diversity of forms: sometimes it seems replaced by the diallage of the dark euphotide, or by bronzite or hypersthene; while the felspar sometimes passes into labradorite, of a blueish grey color, and presenting minute parallel lines or striæ, which traverse the plane of cleavage. One part of this ridge is composed of a very marked rock, consisting of moderately-sized crystals of black hornblende and grey felspar, in equal proportions, among which is disseminated a small quantity of a beautiful grass-green hornblende: it is not improbable that the black hornblende itself is but a deeper tint of this color.

There is also, close to these igneous rocks, but much lower than the tops of them, a mound of dull red jasper, undergoing fragmental disintegration: this is probably a chertified condition of some aqueous strata, which have been brought up with the igneous rocks.

The immediate neighbourhood consists of the hills I have mentioned, probably limestone, more or less obscured by drift-sand.

Inside the ridge of rocks is a small bay, which now only offers a safe landing for boats, but which is said to have formerly extended a long

way further inland behind the ridge mentioned, where there still exists a dry lagoonal depression, about two miles square, and 12 feet above the level of the sea. There is also, on the inner side of the ridge, a modern deposit, the upper margin of which is between 20 and 30 feet above the level of the sea. I have already mentioned one at Ras el Hăd, which is raised at least 12 feet above the level of the sea, also a littoral conglomerate at Ras Rues, the upper part of which is about 12 feet above the sea; and here we have a similar deposit, raised 30 feet above it. This kind of formation we shall find frequently on this coast.

From Ras Jibsh south-westwards, the coast presents a still more desolate aspect, if possible, than it did to the eastward of this cape: not a dark mound now appears to vary the color of the land, close to the sea, or as far as the eye can reach interiorly; but as we approach Ras Abu Ashrin, which is in 20° 58′ N. lat., and 58° 44′ E. long., the light brown color of the land ceases, and is succeeded by a tract of white dome-shaped sand-hills, from one to two hundred feet above the level of the sea. These extend inland as far as the eye can reach, and are scarped upon the sea, where their structure is satisfactorily seen. None of these scarps, which correspond to the hills forming part of the line of coast, are I think more than a hundred feet high. The formation consists of a sandy, granular rock, which, when minutely examined, is found to be chiefly composed of calcareous grains, with a small quantity of hyaline quartz, and dark particles, probably hornblende, from the igneous rocks. The latter character is deserving of notice, because, as no dark particles of this kind appear in the older limestone, they serve as a distinguishing mark for this formation when it approaches the latter in appearance. So uniform is it in its granular structure that there is hardly a fossil larger than the grains of which it is composed to be seen throughout the whole deposit. It is more or less stratified, and, though loose in structure, is sufficiently compact to form a good building stone. The thickness of this formation cannot be further ascertained than that which can be learnt from its scarped parts, which at the utmost do not exceed 100 feet. It is so loose on the surface that the upper and exposed part has become disintegrated for some depth, and, assisted by irregular upheavals, the original formation has probably thus been transformed into the dome-shaped mounds which it now presents. In some parts the sand is so subtle that it yields to the lightest weight, while in others it is so caked that it will bear that of a man. At a little distance it has the appearance of mounds of snow. Can these be the "winding sands" which are alluded to in the Khoran

among which the tribe of Ad are said to have perished? There can be no doubt that they form the south-eastern part of the Desert of Akhāf, and not far from the borders of it where this tribe is said to have settled; and could the gulf of sand at the western extremity of this desert, in which Baron Wrede found a plummet sink to the length of the line attached to it, viz. 360 feet, be the disintegrated sand of this formation, filling some volcanic depression there? There is no doubt that this deposit forms the lowest part of the seaward boundary of the Desert of Akhāf, and it may do so throughout; and that the desert itself extends at first a little inland, and then to the westward, to within 300 miles of the Red Sea, and about 150 miles from the south-eastern coast, where the "Sand-gulf" mentioned is said to be situated. The desert itself is also said to be impassable, and nothing would render it more so than an extension of such sand-hills as those in the neighbourhood of Ras Abu Ashrin.

When subjected to a chemico-microscopic analysis, if it may be so termed, the calcareous particles of which this deposit is composed are found to be nothing more than the remains of minute Foraminifera, the tests of which, having become partially dissolved and re-crystallized, have cemented the whole together; but this having taken place without interfering with the form of their internal cavities, and the latter being filled with the mineral called by Dr. Mantell moluskite (yellow silicate of iron?) allows of the latter being dissolved out by a weak acid, and the origin of the calcareous grains thus ascertained: not only this, but the extreme faithfulness with which the internal cavities are represented admits also of their species being determined.

I have been thus particular in describing this deposit, because we shall find it so widely spread along this coast; and not only here, but extending to the peninsula called Khattyawar, on the coast of India, from whence it is imported into Bombay in considerable quantity, for building and flooring stone; and supplies much the same place that the freestone from Portland does on the southern coast of England. I shall henceforth apply the terms miliolite or miliolitic to this deposit.

At Ras Abu Ashrin the coast sinks nearly to the level of the sea, and continues so for thirty-nine miles, or on to the bay called Ghobat Hāshish, where the same kind of white sand-hills are again met with. I do not think this flat portion extends very far inland before it is stopped by the tract of sand-hills mentioned: indeed I could see that it does not, from the high land of Masira opposite; nevertheless it is the lowest part of the South-eastern Coast of Arabia, unbacked by mountains; and the island of Masira, to which we will now pass over, lies opposite it, about ten miles distant.

Masira is thirty-five miles long, and varies from four to nine broad, and a chain of mountains runs longitudinally through it, which sends off spurs to the principal capes. This chain is chiefly composed of igneous rocks, and its highest mountain, which is in the northern half of the island, is not more than 600 feet above the level of the sea; while hardly any in the southern half of the island exceed 300 feet. Here and there tracts of limestone present themselves, but these are of small extent, and chiefly raised up upon peaks of the igneous rocks. Besides the main chain, which through its spurs and ramifications extends nearly all over the island, leaving only here and there, on its inner side, some sandy plains, there are other small ridges and rocks, which run more or less round the margin of the island, and others in the southern part of the channel, between Masira and the main land, which make their appearance in reefs and small rocky islets.

To the igneous rocks and the limestone there may be added a modern formation, composed of sea-sand, in which are imbedded shells, corals, and pieces of the older rocks. Let us now turn our attention to a more particular description of these formations.

The igneous rocks are chiefly composed of euphotide and diorite, such as we have before seen at Ras Jibsh and Măskat, but, in addition to these, there are more or less homogeneous green and black diorites, also basaltic rocks, more or less scoriaceous, or cellular, and amygdaloidal trap, the cavities of which are filled with calc-spar.

The euphotide is seen as usual in conjunction with its companion the diorite, though not, I think, so plentiful. They form the main chain and principal masses in the island. This, which is the older diorite, contains large crystals of hornblende, as at Jibsh, but of a greater variety of colors, such as green, brown, deep dark red, and black, sometimes in equal quantity with the compact felspar, at others preponderating. At the northern extremity of the island, the diorite is of a newer kind, and from its fine structure, homogeneous appearance, and black color, almost resembles basalt: it is here 200 feet above the level of the sea; it forms the islets, too, and is seen in many parts, but as a less plentiful rock. The fine green diorites, and the trap, also form low round hills, of considerable extent, and the cellular and phonolitic basalt much higher hills, with loose portions on their sides, the whole weathering smooth, and of a dark red brown color.

The accessory minerals which I met with were epidote, with calc-spar, and micaceous iron ore, tremolite, hornblende of different colors, and diallage, with its varieties, also copper. The latter mineral exists in many parts of the island, chiefly, I think, among the fine-grained

green earthy diorites, and low trap hills. I found it in the form of malachite, disseminated and in veins, in the parent rock, and following veins of hyaline quartz which traversed it. In many parts it has been worked, as the excavations and remains of slags and smelting-places in various parts indicate, but the weather-worn state of those I saw would make the time at which they were worked very remote. I have given a short account of these copper veins in this Journal (Vol. II. No ix. p. 400).

From the igneous rocks, let us go to the tracts of limestone. These are of small extent, and for the most part raised on the tops of the older igneous rocks. Beginning at the northernmost end of the island, we find a tract commencing just inside the group of black dioritic rocks which forms this extremity, and from thence extending longitudinally along it for about five miles, making the central ridge or highest elevation of this narrow part of the island. It is scarped towards the west, and slopes into the sand of the sea shore on the eastern side, at the same time that it rises towards the south-west, so that the dip of its strata is towards the east, and that of its strike north-east. For a long way the ridge or upper line of the scarp is not more than 30 or 40 feet above the level of the sea, but at its southern extremity it rises suddenly to about 100 feet. Here it presents a trifid rent, giving rise to three great fissures, which run in different directions towards the sea on each side of the island, respectively. The thickness of the scarps here is from 60 to 80 feet, and their geological section is as follows :—

The upper part of compact limestone, of a whitish yellow colour, cleavable, but breaking with a rough fracture. This is more or less filled with the remains of shells and corals, and extends downwards for 40 feet. It then passes into ten feet of coarse, loose, sandy, silico-calcareous limestone, of a yellow colour, containing numerous shells, and then 10 feet more of the same deposit, traversed by veins of gypsum, after which follows a coarse arenaceous yellow limestone, more or less shelly, which is lost beneath the bottom of the fissure.

Returning to the inner shore of the island, by one of these fissures, I passed, after issuing from it, between the scarp of the limestone ridge on my right hand and the igneous rocks of the island on my left, while the part over which I walked was composed of loose gritty earth of bright red and yellow colours, which seemed to be the finer parts of a jaspidean conglomerate that lay beneath. This conglomerate I thought might be an altered and lower deposit of the limestone formation, which would then make the section of it correspond with that at Mäskat.

The pebbles of this conglomerate have been so changed by the heat to which they have been exposed, that it is impossible to say what they were originally. In it, also, are disseminated here and there small quantities of malachite, which is the case in the silicious conglomerate of the limestone formation that rests upon the diorite at the village of Darzit, north of Mäskat.

The second tract of limestone we come to, proceeding south-westward, is raised on the top of the main chain of dioritic rocks, in the centre of the northern half of the island. Its surface, which is horizontal, is 400 feet above the level of the sea, and its form very conspicuous from a distance, on account of its horizontality, and the contrast of its light yellow colour with the dark rocks around and beneath it. This tract is of an irregular shape, and about two miles long, by a quarter of a mile broad, and its longest diameter is parallel with the longitudinal axis of the island. The southern extremity of its upper surface or plateau, which is attenuated, and not more than 50 feet wide, is undermined on each side for upwards of 15 feet, which leaves only a support of about 20 feet wide in the centre; other parts on this side of the plateau are similarly worn, while there is nothing of the kind on the other sides. This leads one to infer that these excavations were effected by the waves when this limestone tract might have been rising from the sea. The fact also of their being only on the south-western extremity strengthens this, from the north-eastern part being sheltered by the coast, and the opposite side being directly exposed to the south-west monsoon. The surface of this plateau, which is perfectly horizontal, and the strata of the whole mass parallel to it, is bestrewed with the casts of bivalve shells (Conchacea) in the same manner as the hills about Hydrabad in Sindh, and among these, the casts of large species of the genus *Lucina* are by far the most prevalent in both localities. The following is a geological section of this tract:—

Beginning from above downwards, we have a compact limestone, of a whitish colour, cleavable, and breaking with a rough fracture: this is more or less filled with shells and microscopic Foraminifera, and extends downwards for 100 feet. Then follows a coarse yellow limestone, more or less sandy, which chiefly presents the remains of corals, and occupies about 50 feet; after which comes about 50 feet of loose yellow silico-calcareous sand, and red and green arenaceous clays: the upper two-thirds, consisting of the former, are traversed by veins of gypsum, in all its common crystalline forms; and the latter, consisting of the clays mentioned, forms the base of the series, and rests upon the diorite. I did not perceive a conglomerate here to bear out my inference respect-

ing its existence at the base of the last tract, which is not exposed. The only fossils obtained were the following:—

Corbula ?— *Species ?* (Cast.) Trigonal, inequilateral, inequivalve. Breadth $4\frac{1}{4}$ inches, height $3\frac{1}{2}$ inches, depth $1\frac{4}{17}$ inches. Thick posteriorly; compressed anteriorly. *Loc.* Masira, from the surface of the plateau.

Spondylus.— *Species ?* (Cast.) Subovate, inequilateral. Breadth $1\frac{5}{17}$ inch, height $1\frac{1}{2}$ inch, and depth $\frac{9}{17}$ inch. Striæ numerous, close together, and thin, the largest bearing small spines. *Loc.* Masira, from the second tract of limestone.

Although I could perceive traces of numberless fossils in this limestone, the only ones that I saw weathered out were the bivales on the plateau, and the one last mentioned.

Adjoining this tract of limestone are two others, which are only separated from it by a deep ravine: they are a little less in size, and slope towards the east with the tops of the igneous rocks on which they are supported. I had not time to visit them.

The next tract I shall describe is by far the most interesting of all, on account of its fossils. Proceeding south-westwards, we come to this about two miles from the plateau. But it is not similarly situated as to height, for its base is barely raised above the level of the sea, from which it is about a mile inland, among the igneous rocks. Like the southwest extremity of the first tract, this has also been raised by a force applied from below, here in the centre of the mass, which has produced a radiated fracture of the whole, and thrown its parts widely asunder, so as to expose a floor beneath, now half a mile or more in diameter. This floor happens to consist of a stratum of small nummulites, which reveals the nature of the limestone tracts hitherto examined, and establishes the existence of the Nummulitic Series on this part of the South-eastern Coast of Arabia.

The limestone, which rises about 100 feet above this floor, is of the same kind as that already described, and the fossils obtained from the inclosed area, which presents a vast variety, are as follows:—

FORAMINIFERA.

Nummulina.— 1st *Species ?* Circular, slightly convex on both sides, thin at the edge. Breadth $\frac{2}{17}$ inch, thickness $\frac{3}{17}$ inch. Horizontal or wavy; surfaces smooth, sloping gradually towards the circumference; presenting when polished a reticulated structure. Splits into halves, and shows a spire, consisting of a great number of whorls, which are divided into small chambers; the whole becoming more dense towards the centre. *Loc.* Masira.

Nummulina.— 2nd *Species?* Orbicular, doubly convex; Breadth $\frac{4}{27}$ inch, and thickness $\frac{2}{27}$ inch. Surfaces smooth, sloping suddenly to a thin circumference; presenting a reticulated structure, like the foregoing species. Splits in halves horizontally, and exposes a spire, consisting of a great number of whorls, divided into small chambers, the whole structure becoming more dense towards the centre. *Loc.* Masira. *Obs.*—The entire stratum was nearly made up of this and the foregoing species.

ECHINODERMATA.

Spatangus.— 1st *Species?* Conical. Length $6\frac{1}{2}$ inches, breadth $5\frac{1}{2}$ inches, and height 5 inches. Ambulacra four, not depressed, spreading from the centre of the summit of the test, and extending nearly to the margin; grooved anteriorly in the place of the fifth ambulacrum. Genital pores four. Mouth bilabiate, between the centre and anterior extremity. Base oval; carinated in the centre, from the mouth backwards, and covered with small tubercles; bordered on each side by a longitudinal area of smooth polygonal plates. Vent terminal supra marginal. *Loc.* Masira. *Obs.*—The remains of this large fossil were very numerous, and partly filled with the nummulites mentioned.

——— 2nd *Species?* (Incomplete.) Length 2 inches, breadth $1\frac{1}{2}$ inch. Ambulacra five, petaloid, situated in deep furrows, spreading from a point nearer the anal than the oral extremity; the posterior two shortest. *Loc.* Masira.

Cidaris.— *Species?* (A portion only of the test, bearing two big tubercles.) The largest $\frac{7}{27}$ inch in diameter at the base, surrounded by a ring of small tubercles, but none within the circle. *Loc.* Masira.

CRUSTACEA.

Cancer.— *Species?* Carapace sub-elliptical; Diameter $5\frac{1}{4}$ inches transversely, 4 inches antero-posteriorly. Spiniferous laterally; spines five in number, alternately bifid, extending from the orbits backwards; orbits $2\frac{1}{4}$ inches apart. Pinchers large, expanded, equal in size, concave on the interior surface, and bordered on the posterior edge by eight tubercles; tail consisting of six segments. *Loc.* Masira.

CONCHIFERA.

Tubicola.— *Species?* (See a description of the tube among the fossils from Hammar el Nafur, further on.) *Obs.*—They abound among the nummulites in Masira, and are very common in Sindh.

The deposit in which these fossils were imbedded bears little trace of them when not weather-worn or disintegrated, so that this might partly account for my having passed them over in the other limestone tracts. Here they abounded all ready to my hand, but being alone

when I fell in with them, and the sun having set, I could not examine the place so much as I wished, nor bring away so many fossils as I desired, and the next day we removed to a station several miles distant; so that I had not an opportunity of returning to this really garden of fossils, much to my regret.

The last unmentioned tract of limestone in this island is that which forms two mountains 500 feet high, at its south-western extremity. It is a narrow portion, about a mile long, and raised, as usual, on peaks of the diorite. There were no loose fossils about it, and the character of the limestone I have already described. Its base is buried in the debris of the superincumbent mass.

All these tracts are doubtless parts of the same limestone formation, which was once continuous over the island of Masira, but has since been broken up by the eruption of its igneous rocks, and more or less carried away by the action of the waves, during the time that the island has been gradually rising from the bottom of the sea to its present position. The presence of the bed of nummulites, too, in one portion of it, shows also that the whole belong to the Nummulitic Series.

Having now described the two principal formations in the island of Masira, viz. igneous and aqueous, let us turn our attention for a few minutes, before returning to the main land again, to the more modern formations to which I have alluded. These are two in number, one of which, perhaps the latest of the two, is seen in the north-eastern part of the island, where it is about 12 feet thick, and raised about 40 feet above the level of the sea, about a mile from it. It is scarped on its seaward side, and runs parallel to the north-eastern extremity of the island, which is truncated, and on the other side thins off upon the rocks on which it is supported. It is composed of shells, and pieces of coral, from which the animal matter has disappeared, and portions more or less rounded of the limestone and igneous rocks of the locality, all of which are slightly held together by sea-sand, consisting of minute grains of the same kind of material. It lies between the two groups of igneous rocks which form the two angles of this truncated extremity of the island, and is firmly adherent to their sides.

The other formation, which is but a finer deposit of the last mentioned, and perhaps a little older, is considerably elevated above the sea. It may be seen close to the village of Gyren, on the inner side of the south-western half of the island. It only differs from the miliolite of the opposite coast in containing more particles from the igneous rocks, and is raised on the top of some greenstone peaks, about 200 feet above the level of the sea.

Before concluding my remarks on Masira, I should mention that in the north-east half of the island, a little inland of Ras Jazirăh, there is a small low mound of aqueous strata, projecting from the plain of igneous rocks which exists there. These strata, which have been rendered jaspidean by heat, are in a vertical position, and composed of an extremely fine flinty material of a red or flesh colour, probably originally a fine clay. They are undergoing fragmental disintegration, and the pieces very much resemble leelite. To what formation this belongs I cannot say, but probably not to the limestone formation of Masira, for that rests on the igneous rocks in which this appears to be enveloped. I have mentioned the existence of a similar mound, and similarly situated, at Ras Jibsh.

Returning to the main land, to the bay called Ghobat Hashish, which is opposite the south-western extremity of Masira, and to which we have already brought on the low land behind this island, and the sand-hills from Ras Abu Ashrin, we find the compact limestone again appearing from beneath the miliolite. This is seen on the western side of the bay, where it is about 80 feet high, after which it rises gradually on to Ras Jazirăh, about 100 miles distant, where it is about 480 feet above the level of the sea; and the direction of this part of the coast, being due south, as I have before stated, shows also that the strata gradually rise in this direction, as well as to the south-west, which we shall see presently.

For the specimens and information I possess of this part of the coast I am indebted to the kindness of Lieut. Grieve, who surveyed it in 1847.

Rock-specimens from the west side of the bay of Hashish, and from Ras Sărāb, about twenty-five miles south of it, show that the limestone formation which here emerges from beneath the sand-hills, consists of a fine compact rock, some of which is magnesian, heavy, and of a grey color.

Next comes the little island called Hammar el Nafur, which is about twenty-five miles south of Ras Sărāb, and of all the information which Lieut. Grieve has communicated to me, that from this little island and another cape next to it, called Ras Kariat, with their specimens, are by far the most interesting and important. It is extremely fortunate that this little island should exist just here, at the commencement of the rise of the cliff, which we shall find by-and-bye carried up 4000 feet above the level of the sea far beyond our reach; for from its form and position, together with the cape mentioned, we obtain an unmistakeable geological section of the cliff for 320 feet down from its summit, which is the height of Hammar el Nafur.

This island is about 400 yards long by 300 broad, and its summit, though flat, is split in all directions. Rock-specimens from it show that it is composed of compact white limestone, and concretionary flints above; the former breaking with a more or less smooth fracture. This is stated to extend down 150 feet, and to present no loose fossils. Then comes 50 feet of white earthy or gritty calcareous deposit, more or less mixed with argillaceous matter, of a greenish white color, in which there are many fossils; and the rest is stated to be greenish white clay, without any; the bottom of the sea everywhere in the neighbourhood being composed of the latter material.

This clay, just stated to be of a greenish-white colour, is meagre to the touch when dry; breaks with an irregular rough fracture; receives a polish when scraped with the nail; does not adhere to the tongue; does not effervesce with acids; does not mix readily with water, but, when once rubbed up with it, remains for many days suspended in it, in an impalpable powder. Before the blow-pipe it dries up, becomes red and porous, and then passes into a black slag. When in combination with more or less calcareous material, it forms an excellent soap.

Having described this clay, I will now add a list of the fossils which Lieutenant Grieve sent me, and with them include those which came from Ras Kariat, nearly opposite, since the strata and fossils of both places are said to be exactly the same, and the specimens confirm this. They are as follows:—

FORAMINIFERA.

Nummulina.— *Species?* Circular, compressed, terminating at the circumference in a thin edge. Breadth $\frac{2}{17}$ inch, thickness $\frac{1}{36}$ inch; surfaces smooth, without any marking; presenting a spire internally, with many whorls, divided into small chambers. *Loc.* Hammar el Nafur and Ras Kariat, in the gritty calcareous deposit below the compact limestone.

Orbilolites?— (Impressions only). 1st *Species?* Oval. Length $\frac{8}{17}$ inch, breadth $\frac{6}{17}$ inch.—2nd *Species?* Circular. Diameter $\frac{5}{17}$ inch. *Loc. idem. Obs.*—Found in the marl passing from the gritty calcareous deposit into the clay.

ECHINODERMATA.

Echinocyamus.— *E. pyriformis* Ag. mihi. (Tab. 22, figs. 19—24, et *Echinoneus placenta* Goldf. Tab. 42, fig. 12.) Sub-pentagonal. Oval. Length $\frac{13}{24}$ inch, breadth $\frac{17}{24}$, height $\frac{3}{24}$. Subtruncated anteriorly, pointed posteriorly; mouth central; vent inferior, and situated a little distance from the margin. *Loc. idem.*

Echinocyamus.— *E. siculus* Ag. mihi. Oval, depressed. Length $\frac{8}{74}$ inch, breadth $\frac{7}{74}$ inch, height $\frac{2}{74}$ inch. Mouth and vent the same as in the foregoing species; ambulacra five, petaloid, not depressed. *Loc.* Hammar el Nafur and Ras Kariat. *Obs.*—This, and the foregoing species, are numerous in the earthy deposit below the compact limestone, together with the nummulites, which, on the other hand, are scanty, judging from the specimens of the deposit sent to me, but they are probably more numerous in other parts.

Clypeaster.— *Species?* Sub-pentagonal. Length $2\frac{8}{12}$ inches, breadth $2\frac{3}{12}$ inches, height $1\frac{5}{12}$ inch. Summit sub-central, anterior; ambulacra five, petaloid, in furrows, each enclosing a raised area; genital pores four; none posteriorly, mouth sub-central, depressed, surrounded by five tubercles, or projections, with a groove between each, presenting ambulacral pores; vent sub-marginal. *Loc.* Ras Kariat.

CONCHIFERA.

Tubicola.— *Species?* Tube only. Circular. Diameter $\frac{1}{2}$ to 1 inch; slightly increasing downwards. Straight or slightly crooked; sometimes bent at an obtuse angle; length unknown. Wall of tube from the thinness of a wafer to $\frac{1}{12}$ inch; composed of concentric layers, smooth and round internally; uneven, and presenting transverse striæ or rugæ externally. Filled with the material in which they are imbedded. *Loc.* Hammar el Nafur, Ras Kariat, Masira.

Teredo Navalis.— *Species?* Tube, sub-circular. Diameter above $\frac{1}{4}$ inch, increasing slightly downwards to a point, where it suddenly dilates; sub-flexuous; length of specimen $2\frac{1}{2}$ inches, real length unknown. Divided internally above by a transverse septum, which ends below where the tube dilates, (probably close to the animal,) in the two compartments becoming separate syphons, which are in contact in the middle, and entirely separated from the rest of the tube. Wall of tube $\frac{1}{74}$ inch thick; external surface uneven; irregular; striæ arranged longitudinally, and becoming circular where the tube suddenly expands. *Loc.* Hammar el Nafur and Ras Kariat. *Obs.*—The first of these tubes abounds in the earthy limestone or marly deposit with the nummulites, both here and in the island of Masira. They are also very common in Sindh. A specimen of one is figured in Pl. xxi. fig. 1 of Grant's Geology of Cutch, (loc. cit.) where it has been provisionally called "*Serpula? recta*" by Mr. Sowerby.

CONCHACEA.

Lucina.— *Species?* (Cast, imperfect.) Circular, compressed, equivalve, presenting little tubercles in circular depressions on both sides, which

appear to be impressions of the mantle. Breadth about 2 $\frac{9}{12}$ inches, and length 2 $\frac{9}{12}$ inches. *Loc.* Hammar el Nafur. *Obs.*—This is a facsimile of one of the species of Lucina found commonly about the hills at Hydrabad in Sindh, and like those on the surface of the plateau in Masira. It is a characteristic fossil of the upper part of this series, from which therefore it most probably came in the island of Hammar el Nafur.

GASTEROPODA.

Natica.— *Species?* (Cast, imperfect.) Breadth 4½ inches, and length 3½ inches. *Loc.* Hammar el Nafur and Ras Kariat. *Obs.*—There are several imperfect casts of large Naticæ from the softer limestone of these localities. In Sindh, also, such casts are found, composed almost entirely of large nummulites, together with minute and small Foraminifera. They, therefore, in the absence of the larger nummulites, here serve to establish the nature of the deposit in which they are found; throughout which the shells of Conchifera and Gasteropoda would seem to have entirely disappeared, as in most other parts of the Nummulitic Series with which I am acquainted.

Before proceeding further, it is worth while to compare the strata of the island of Hammar el Nafur and Ras Kariat, on the main land, with a section of the nummulitic strata forming the range of hills at Sukkur, in Sindh. This section was kindly sent me by Dr. Malcolmson, of the Bombay Medical Service, who states in his letter as follows:—"I have been over the Sukkur range of hills to their termination at Daji Kot. There is but little diversity in the whole range, which in no place exceeds 400 feet in height. The whole is one mass of nummulitic limestone, more or less disintegrating. It is, however, strange that the upper strata are in many places *very compact, and contain but few fossils, but are very plentifully interspersed with flints;* some of the flints contained large nummulites. The escarpment of the whole range faces the west. The strata are perfectly horizontal. Some of the limestone is of a cream colour, and forms a good building stone, which wears well, and does not seem to suffer from atmospheric exposure. About twelve miles from Sukkur I found a bed of clay *underlying* the nummulitic limestone, filled with the impressions *only* of shells. [This clay, of which Dr. Malcolmson sent me a specimen, is of the same kind as that at Hammar el Nafur.] The hill is here 250 feet high, and composed entirely, in the lower part, of nummulites, overlaid by compact limestone, containing flints. I traced the out-cropping of the clay for about half a mile."

Here, then, we have nearly the same strata as at the island of Hammar el Nafur and Ras Kariat, and that too about the same height, viz. 400 feet, composed of *compact limestone* above, then *nummulites* in a *loose disintegrating (gritty ?)* deposit below, and afterwards *clay*.

It is important to establish the exact nature of this series at Hammar el Nafur and Ras Kariat, for the reasons I have before stated, viz. that as the cliff rises towards the south-west we shall soon find these strata elevated beyond our reach, so that when we come to the height of 4000 feet we shall have to assume that they still form the summit there, from their existence at Hammar el Nafur and Ras Kariat; unless we can prove this by the presence of the nummulites themselves, or some other allied fossil. The disintegration of the deposit in which the great mass of nummulites are imbedded I have generally observed to be the case in all the specimens I have seen from Egypt, Sindh, and Cutch. I have not yet seen a compact hard limestone charged with nummulites.

Passing back to the coast opposite the island of Hammar el Nafur, Lieut. Grieve states this to be "low, and to present a range of small dark peaks, rising gradually from the beach." These are probably the tops of low igneous rocks, which we might expect to be near, from the break in the cliff, and the upheaval of Hammar el Nafur opposite it.

The next place from which I have specimens is Ras Kariat, already mentioned. This cape is nine miles south of the island of Hammar el Nafur, and about forty north of Ras Jazirăh. From this point the cliff, which is 280 feet high, and has hitherto been in detatched portions, is extended on continuously to within a few miles of Ras Jazirăh. The upper part of it, like that of Hammar el Nafur, is composed of compact white limestone with concretionary flints, passing below into an earthy gritty one, thence into a marly deposit, and lastly clay. The fossils are the same as those of Hammar el Nafur, and have been described under the list from that island. I received also large portions of radiated and columnar crystallized carbonate of lime, pointed at the circumference, translucent, and of a greenish white colour; they are crossed by transparent wavy lines, as if they had been formed by successive additions, and appear to come from the earthy limestone near the green clay; also specimens of gypsum, of which some of the tubes of the Tubicolæ were made up. The occurrence of gypsum here should not be forgotten, for it exists in the same position at Masira and Măskat, viz. below the compact limestone.

From Ras Kariat the cliff, as before stated, extends on uninterruptedly to within a few miles of Ras Jazirăh, or a little beyond Ras Markas, which is nine miles from the former cape, where they are 480

feet above the level of the sea. Rock-specimens from this show that the base is composed of a pinkish, compact, sub-saccharoid, magnesian limestone, which slowly effervesces with acids; also a rock of the same kind, but filled with the cavities of small shells, viz. Cardium and Cerithium, containing selenite. The Cardium is oblique, inequilateral. Length $\frac{1}{2}$ inch, and breadth $\frac{3}{14}$ inch. We shall find a rock almost identical with this occurring at Makalla, about 600 miles S. W. of it; the proximity, however, of igneous rocks, which we shall find in both localities, have probably influenced this resemblance, more than the continuity of the stratum.

Lastly, we come to Ras Jazirăh, the end of this portion of the coast, which now suddenly returns, from running N. and S., to its general direction, viz. N. E. and S. W.; and here we have another eruption of igneous rocks. This is confined to the cape, and its immediate neighbourhood, but it presents as complete a picture of such a disturbance as can well be witnessed. The continuity of the cliff, which on either side is uniform, and horizontal as far as the eye can reach, is here entirely broken up by the igneous rocks, and the detached portions of its strata thrown into all kinds of positions, and weathered into all kinds of shapes; while the dark rock appears between or below them, or in separate peaks, among the general wreck. Where the white strata overlie the igneous rock, they are discoloured for some distance, red and black: this would seem to be the passage into the former, just as we saw it in the base of the plateau at Masira, where these coloured strata are composed of red and dark green clays; for the limestone here probably rests on dioritic rocks, as at Masira, and the rupture has been caused probably by their subsequent elevation, and by the effusion, perhaps about the same time, of more igneous matter. Specimens from the island which joins the cape at low water, and from which it takes its name, show that it is formed of a rock belonging to the euphotide and diorite before mentioned, and of which probably the igneous rocks on shore are principally composed. These specimens consist of brown compact felspar, in which there is an equal quantity of sparkling laminated black hornblende, in small crystals; and on the plane surfaces of the specimens an ophiolitic or nephritic deposit, like that seen about the euphotide hitherto met with. On either side of this eruption the cliffs, as before stated, are continuous, and their strata horizontal, as far as the eye can reach, but their whiteness, which hitherto has made them look so much like those on the south-east coast of England, seems here to cease, and to give place to a light yellow tint.

From Ras Jazirăh the cliff is continued on, with the exception of a

break here and there, (where it falls back and gives place to a sandy plain in front,) to Ras Shaherbataht, and Ras Gharau, which capes are within a few miles of each other. Here the cliff is 800 feet above the level of the sea, and has been gradually rising to this since leaving Ras Jazirăh, a distance of 110 miles. Capt. Haines states that the upper strata here are composed of limestone, below which come "chalk" and flints.* As we approach this cape, we observe that the cliffs begin to present large caverns, which appear to have been solely excavated by the waves; they are very similar to those seen on the Bill of Portland. I could not help thinking that in this way most of the great caverns which we shall by-and-bye see in the mountains have been formed, and which now serve for the habitations of most of the Bedouins who live on the high land of Southern Arabia. At Ras Shaherbataht the same kind of uniformity and continuity of cliff meets the eye on either side, as at Ras Jazirăh, only that it is nearly twice the height; but as we approach the centre of Kuriyah Muriyah Bay a totally different aspect presents itself: here we observe at Ras Shuamiyah, which is about 135 miles from Ras Jazirăh, another and much more extended outbreak of igneous rocks than at the latter point. The cape called Ras Shuamiyah is formed by a dark black-looking igneous rock, and on either side of it black dykes irregularly extend up through the white strata, in some places raising them and running along between them, and in others attaining the summit and flowing along the surface above the cliff, the uniformity of which may well be conceived to have become totally destroyed by this eruption. In some parts it is raised higher than we have hitherto seen it, in others more depressed, while the land interiorly appears to have participated in this, if not in a former more general disturbance; and a few miles further south-west, its irregularities still increasing, brings us to the high land before mentioned, which is 4000 feet above the level of the sea, with the white cliff we have been passing at the upper part of it. This is the eastern limit of the elevated tract of Southern Arabia, and the western limit, on the coast, of the low land or Desert of Akhăf. The south-western part of Kuriyah Muriyah Bay is bordered by the former, which, breaking down towards the extremity of the horn, ends in a granite mountain, 1200 feet high, which forms the cape itself, and is called Ras Nus.

The appearance of this granite mountain probably explains the grand and sudden upheaval of the coast here. It is the first granite we have met with, but we shall soon find that we have come to an immense tract of it, which not only extends along the coast south-westward for several miles,

* Journal Royal Geograph. Soc., Vol. XV.

but also eastwards, where it forms the greater part of the Kuriyah Muriyah islands, to which we will now direct our attention.

They are five in number, neither of which is more than twenty-five miles from the coast; and the farthest apart are not more than thirty-five miles from each other, while they are all in the same parallel of latitude. The largest, called Hăllăniyah, is about seven and a half miles long, and about three and a half broad. The next in size is Soda, which is about three miles long, and two broad. Haski and Jibliyah are each about a mile square, and Gharzaut is hardly more than a large rock.

Hăllăniyah is composed of about one-sixth limestone, and the rest of igneous rocks. The limestone occupies the northern part, and forms a cape 1645 feet above the level of the sea; its colour generally is a light yellow to the water's edge, and its strata, though tilted up and displaced where they are in contact with the igneous rocks, are undisturbed at the cape, any further than is caused by their elevation of about fifteen degrees towards the north. The late Dr. Hulton, from whose description of these islands* the following remarks have been extracted, states:—

"About the centre of the island [Hăllăniyah] the hills rise into a cluster of pointed spires, the highest of which was computed by trigonometrical measurement at 1510 feet above the level of the sea; and from these, similar hills run in all directions, preserving in most cases the form of interrupted ridges. At the eastern [northern ?] extreme, the land assumes a different state; a perpendicular headland, 1645 feet in height, boldly projects into the ocean, and for some distance to the westward appears a continued mass of table-land, accidentally heaved up, as it were, at the end of the island. With the exception of this high land the rest of the island is chiefly composed of granite, varying somewhat in its structure, and the proportion of its fundamental ingredients, upon which also depends a variety in its colours. The most interesting feature of the granite is the manner in which most of its ridges are surmounted by a dark-coloured rock, allied in its characters to those of the trap order, more especially to greenstone. [The latter is our diorite, and the dark-coloured rock probably euphotide, which we have before seen to accompany it.] This is found passing through the body of the hills in the form of dykes. The same rock is seen abundantly in the form of veins and seams, traversing the granite in all directions. It would appear as though by some powerful internal impulse this substance had been injected into fissures in the granite, produced by the same violent action. To a person viewing it

* Trans. Bombay Geograph. Soc. 1839-40, p. 189.

from a moderate distance, the distribution gives rise to an appearance of an unusually dark shade running along the summits of the hills, as most of our party at first fancied. These dykes and seams do not follow any general rule in regard to their direction, but are entirely influenced in this respect by the disposition of the granite, which follows no particular course. They vary from a fine vein of a few inches to a stratum of eighteen or twenty feet in breadth. In mineral composition, too, they differ no less materially. Most of it I have stated to resemble greenstone, in the compactness and simplicity of its structure, and hornblende appears to be the predominant ingredient; but by the intermixture of felspar in greater or less quantity, rocks of a very different nature result, still occupying the same relative situation. In some places the felspar is disseminated in the form of distinct crystals, communicating a porphyritic structure; in others quartz is abundantly intermingled, giving it more of a granitic aspect. In the latter there is a tendency in the compound to diffuse itself more extensively through the granite bed, losing its character as a stratum, and entering largely into the formation of the hill itself. In fact, it appears to undergo, by this accession of felspar and quartz, a regular transition to granite itself, and merely differs, as far as the eye can judge, in colour, which, from the presence of hornblende as a subordinate mineral, becomes of a dark speckled hue. . . . . In both this and the prevailing kind of granite, mica, if not altogether wanting, is a very scarce ingredient, and is found chiefly in the light-coloured veins of granite intersecting the granite mountains." There can be no doubt, I think, that this is an altered state of the euphotide already described: the author knew greenstone (diorite); he also knew granite, and trap; and there is no other "dark coloured rock," that I saw, in this part of Arabia, "allied" to greenstone, but "euphotide."*

"The eastern end [northern ?] of the island is that which attains the highest point of elevation, and is composed of a secondary limestone pretty regularly stratified towards the sea. It contains in its substance a few fossil shells, but is not remarkable for anything further than its proximity to the granite, its greater elevation above the sea, and its

* In my "Geological Observations on the Igneous Rocks of Maskat, &c.," (see this Jl. Vol. III. No. xiii. p. 128,) I have stated that Dr. Hulton had not mentioned either euphotide or diorite in his account of the Kuriyah Muriyah Islands, nor did I see any of these rocks at Marbat. But I had not then begun to put together this paper, and therefore had neither read Dr. Hulton's account, nor looked over my specimens from Marbat, with such attention as I have done since, which will account for any discrepancies that may appear in this and the paper alluded to regarding the rocks of these two localities.

insulated situation. It is nowhere intersected by veins of either granite or greenstone."

I know nothing myself more of this island than that which I have stated previous to quoting Dr. Hulton's description, and have nothing to remark further respecting it than that I would direct attention to the depth of the limestone strata here, which we shall find useful by-and-bye in determining its real depth throughout the neighbouring coast.

The small rocky island of Gharzaut, which is a little N. N. E. of Hälläniyah, and 200 feet high, is composed "exclusively of granite of a reddish colour, and a fine crystalline structure."

Soda, which is six miles west of Hälläniyah, presents a peak 1310 feet above the level of the sea. The composition of the hills is granitic, with the same distribution of dark-coloured strata as that noticed on Hälläniyah, though not quite so conspicuous. "The granite on the eastern end, and on the central part, is of a dark grey colour, with extensive veins of a light colour, traversing it in various directions. That on the western end is a mixture of red and grey granite, in varying proportions, the red preponderating in most localities, and of a fine texture, similar to that of Rodondo [Gharzaut]."

The geological structure of Jibliyah, the highest point of which is about 500 feet, is stated to be "essentially primitive, but with a greater variety in the appearance of the rocks than we found at Hälläniyah. The outer detached rocks are of similar composition, being formed of a species of dark-coloured granite, in which hornblende appears to enter largely. The island itself is composed of porphyritic syenite, the colours of some specimens affording a rich and diversified appearance."

Haski, the most western of all these islands, and the nearest the shore, presents in its highest peaks an altitude of about 400 feet. "In its geological characters, too, it is nearly similar [to Jibliyah], though the reddish-coloured granite, which is common in Soda, is here found to constitute the greater portion of the island, the remainder being composed of a species of variegated granite and porphyry."

Thus we see that these islands are, with the exception of Hälläniyah, all composed of igneous rocks, and that, too, chiefly of granite; and we also see that they are all nearly in the same parallel of latitude as the village of Hasek, which is only nine miles north of Ras Nus, the south-western extremity of Kuriyah Muriyah Bay, and which itself, as before stated, is also formed of a granite mountain. Further, if we look at Captain Haines's beautiful chart of Kuriyah Muriyah Bay, we shall not find a sounding of 50 fathoms north of this little chain of islands

and a line extending from them to Hasek, that is between them and the main land to the north, while immediately south of them and this line the soundings sink to 145 fathoms, and no bottom, showing that there is a great depression on this side, which we also learn by the soundings to be continued westward to Ras Nus, and along the coast as far as Marbat, where the granitic tract ends.

Returning again to the shore, we find ourselves opposite a very different coast to that we have just passed: one now of 4000 feet instead of 800 feet above the level of the sea; and commencing from Ras Nus, where we left off, which is the seaward point of demarcation between the low and high land, we find the granitic tract on shore to commence here, (though at sea it begins much farther eastwards, as we have seen in the Kuriyah Muriyah islands,) and to extend on to Ras Marbat, a distance of forty miles, where it ends. At first it is narrow, and runs along the base of the broken-down table-land, but the latter, soon falling back, gives place to an expansion of it into a low field of igneous rocks, which is about ten miles wide, and terminates at the cape mentioned. This field, which is backed by the precipitous declivity of the table-land, presents an almost uninterrupted uniformity in its lowness, except at one point, near the sea, where an isolated pyramidal mountain of the main land remains, as a type of what once existed over the whole area. This mountain or pyramid, called Jibal Jinjări, which is 1300 feet high, is stated by Captain Haines to present chalk and gypsum in its composition; and so far it is interesting, because we know that these two substances exist in a fixed part of the upper strata of the white limestone series, from what we have seen at the island of Hammar el Nafur and Ras Kariat, where it is only 320 feet above the level of the sea, and from their presence in similar situations in other parts. By chalk here is meant a soft white earthy limestone, or gritty calcareous deposit; there is no genuine chalk on this coast that I have met with, though the former is a close approach to it, and, in the absence of the latter for comparison, might easily pass for chalk.

In the immediate vicinity of Ras Nus the limestone strata, capping the detached and broken-down masses of the table-land, (which in this way here reaches the sea,) are much and variously inclined, while a similar disturbance is evinced by the older igneous rocks of the low plain which follows, from the variety of coloured dykes with which they are veined. I explored about a dozen square miles of these rocks near Marbat, and also ascended the precipice of the table-land at this point, the particulars of which will now occupy our attention.

The igneous rocks, as before stated, terminate at Ras Marbat in a low plain, which shelters a little bay and village of the same name on its inner side, that is between it and the main land. This plain is about four miles square, and 30 feet above the level of the sea in its centre, from which it gradually slopes on all its free sides to the sea. It is more or less wavy, and here and there interrupted in its continuity by irregular fissures running to the sea, and by projections a few feet above the surface of the granite rocks of which it is composed, while at the bottom of the bay is a group of granite hills, about 100 feet high.

The igneous rocks of this plain and its neighbourhood consist of red and grey granite, red protogine granite with black hornblende sparcely mixed with the chlorite, syenite, euphotide, and coarse and fine-grained diorites, green chlorite brecciated with fine compact brown limestone, and cemented together with calcareous matter; to these may be added gneiss, which appears in vertical strata in the midst of the groups of red and grey granite rocks projecting from the plain.

The red protogine granite appears to be the most abundant; and the grey granite the oldest in appearance, though the line of demarcation between the two is by no means evident, for they seem, so far as I saw, to pass into each other.

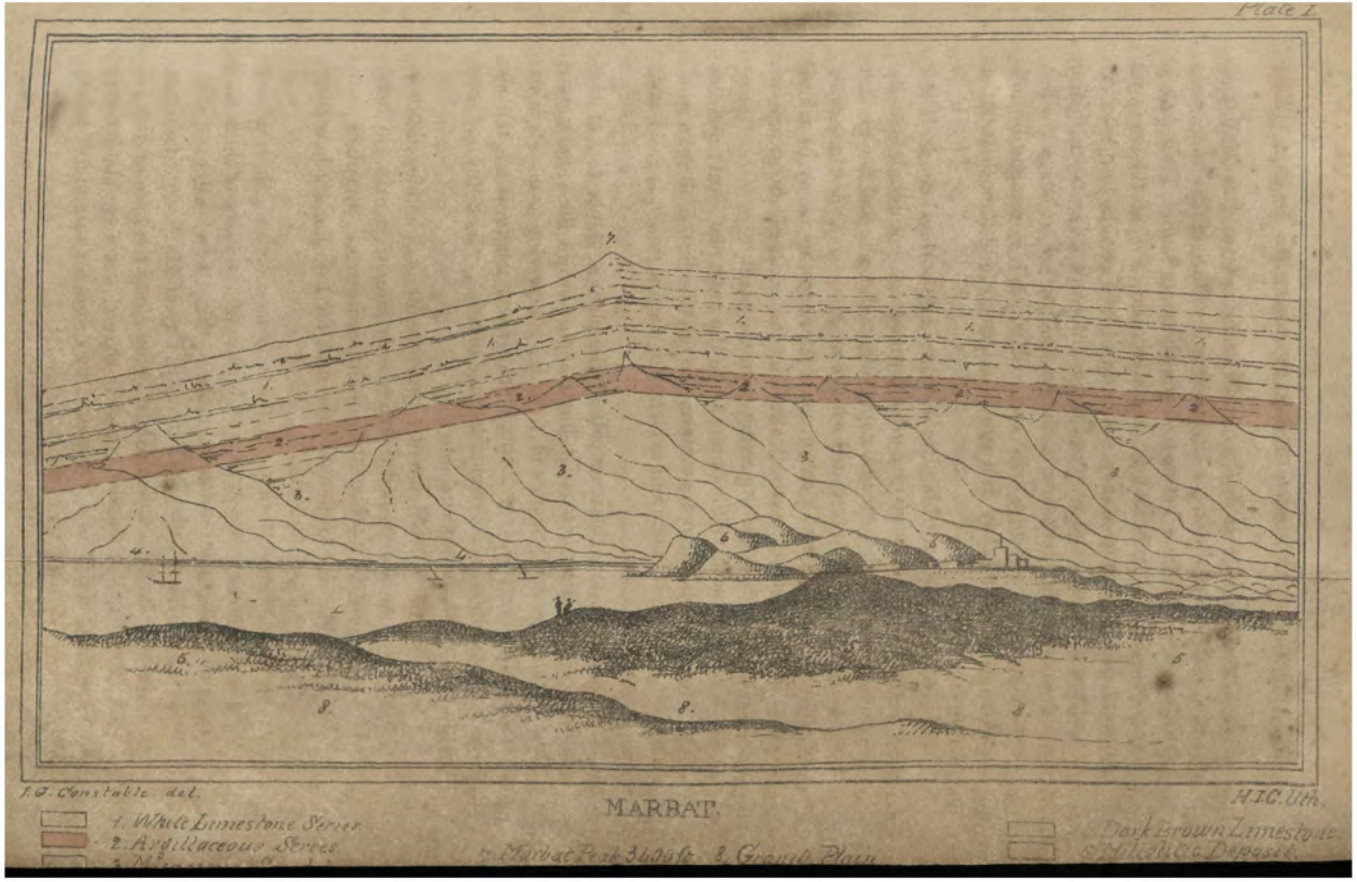
The granite hills on the inner side of the plain at the bottom of the bay have been thrown up through fine compact brown limestone strata, which forms a part of them, and from its effervescing so slowly with acids, and its heaviness, is probably more or less magnesian. It also, when minutely examined, presents laminæ of mica, which in some way or other have been transported into it.

I did not see the rich red granite, grey syenite, euphotide, diorites, nor chlorite breccia *in situ*, and therefore only infer their existence here from having picked up pieces of them in different parts of the plain; but there can be hardly any doubt of the fact, for I do not see how they could have come there otherwise.

With these few observations on the igneous tract, which is about ten miles broad, let us pass across to the base of the scarp of the table-land; and, fortunately for our examination of this, there is a dry bed of a great torrent, which empties itself into the Bay of Marbat on the inner side of the granite hills, and which, running along the base of the declivity for two or three miles, completely separates it from the igneous rocks, and exposes its strata unobscured by debris for several feet below the surface of the immediate neighbourhood.

The precipitous face of this table-land here is scarped for about two-

Plate I.



7.
1.
2.
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6.
8.
J. G. Constable del.
H.I.C. lith.
MARBAT.
1. White Limestone Series.
2. Argillaceous Series.
Dark Brown Limestone.
Marbat Peak 3400 ft. 8. Gravel Plain.

fifths of the way down, and then slopes outwards in ridges, like great buttresses, which, parting from the base of the escarpment, in pointed extremities, expand out to a great extent as they reach the plain below. Commencing, then, from the base of these opposite Marbat, where the escarpment is 3400 feet high, and where the torrent bed before mentioned is 20 feet deep, we have from below upwards the following geological section, viz., coarse micaceous sandstone, of a yellowish brown color, becoming finer as we ascend, for 1700 feet; then passing into argillaceous strata of a red color, which continue for 300 feet; and lastly into white limestone strata, which form the rest of the series, an extent of 1400 feet.

These divisions I will now describe more in detail, and commencing from below, we find the sandstone of a compact gritty structure, becoming finer as we ascend; massive at first, but becoming thinly laminated, and in the upper part of all thicker again, and jointed; breaking with a rough earthy fracture throughout; of an ochrish brown color, and ferruginous aspect below, becoming more yellow in ascending, and then of a dirt-brown color at the top; presenting mica throughout, but more in some parts than in others, though diminishing generally in quantity towards the upper part.

The dirt-brown colored fine deposit of this sandstone passes into the argillaceous division, which presents strata of various colors, but chiefly red. One, a dark red clay stratum, and of a soapy nature, presented an excavation, which the Bedouins told us was made by their women, who came there occasionally to eat the clay; whether from hunger or a vitiated taste I could not discover, but probably the latter.

These red strata pass into white and grey compact limestone strata, more or less thick, more or less fine in structure, more or less lithographic in appearance, above which comes a whitish yellow chalky deposit, more or less argillaceous, from which the Bedouins cut their pipes, and then a white compact limestone again. The latter lies in heaps of bare rocks, weathered into rude architectural-looking piles, 300 or 400 feet high, and two or three miles inland from the summit of the table-land, as seen from below, so that this much must be added to the 3400 feet, which height was obtained by triangulation from a base measured on Marbat plain, where, from what I have stated, the real summit could of course not be seen. We had no means of obtaining the height of this scarp in any other way.

The soil on the summit of the table-land is of a brick-red color, and more or less argillaceous; it seems to come from the cavities and disintegration of the limestone, which, where it is bare, has been

weathered into sharp undulating ridges, as it is on some parts of the coast, where the sea is washing it away without making any deposit.

The following are the fossils which were obtained from these limestone strata:—

FORAMINIFERA.

Alveolina, (D'Orbigny.)— *Species?* Ovo-spheroidal or melanoid; long diameter $\frac{6}{30}$ inch, short diameter $\frac{5}{30}$ inch. Sulcated longitudinally, in sigmoid lines, which extend from apex to apex, marking the divisions of the chambers, which present transverse parallel striæ, dividing them into compartments. *Loc.* Marbat, from the summit of the formation inland downwards to an unknown extent. *Obs.*—This fossil varies in size below the measurement given. It is a characteristic fossil, and occurs also in great abundance in lower Sindh, near Tatta, where it is well known by the name of "Tomra," and forms the sacred strings of beads worn round the neck by Hindu devotees, and others of that religion. It differs from *Fascicolites* (Parkinson) *elliptica*, Sow. (Grant's Geol. Cutch, pl. xxiv. fig. 17), which on the other hand abounds in the hills of Hydrabad, in being more spheroidal, and exceeds a little in size the largest of those I met with at Marbat.

Operculina, (D'Orbigny.)— *Species?* Discoidal, nautiloid, very thin. Width $\frac{5}{77}$ inch. Surface presenting four whorls, divided into many chambers, which are reflected, and increase regularly from the first to the last cell. *Loc.* White limestone, Marbat. *Obs.*—This little fossil frequently accompanies the foregoing.

Orbitolites.— *Species?* Circular, concave, extremely thin in the centre, abruptly expanding into a thickened rim at the circumference. Breadth 1 inch, thickness at the rim $\frac{1}{17}$ inch. Surfaces smooth, presenting a series of concentric rings, alternately raised and depressed. Internally composed of minute cells, arranged in concentric circles, which are multiplied vertically to four or five tiers deep, as they extend from the centre to the circumference. *Loc.* Marbat. *Obs.*—This fossil, which is not present in the specimens I possess from the summit of the white limestone strata, varies in size below the measurement given. It is a characteristic fossil, and the species and specimens increase in number as we approach the coloured division, where whole strata are composed of them, as we shall see hereafter. The Alveolina and Operculina above described are also found in company with this large Orbitolite. It belongs to d'Orbigny's genus Cyclolina, (Foram. Fos. du Bas. Tert. Vienne, p. 139, Tab. xxi. figs. 22—25,) and its structure has been beautifully figured by Carpenter, (Quart. Jl. Geol. Soc. Vol. VI. pl. vii. fig. 24.) It also occurs in great

abundance in the Hala Mountains, near the Buran River, in Sindh, together with the spheroidal Alveolina called "Tomra" above mentioned, and an Operculina. All three appear to agree with the three as they are found together in Arabia as to size and outward appearance, but the internal structure of the first and last slightly differs. The cells appear larger in the Sindh Orbitolite, and the whorls more numerous in the Sindh Operculina.

Corbis ?— *Species ?* (Shell, imperfect.) Breadth $3\frac{2}{17}$ inches, length $3\frac{4}{17}$ inches. Cancellated; resembling *Corbis pectunculus.* (Lamarck et Tab. 13, fig. 3—6 Paris Basin Deshayes.) *Loc.* Marbat. *Obs.*— Found in a small block of fine white compact limestone, with individuals of the foregoing fossils.

Inoceramus ?— *Species ?* (Specimen imperfect.) Shell thin, suborbicular. Length $2\frac{1}{4}$ inches, breadth 2 inches. Inequilateral, striated concentrically, cardinal edge of upper valve straight. *Loc.* Marbat. *Obs.*—Found in the block of limestone just mentioned.

GASTEROPODA.

Pileolus.— *Species ?* (Specimen imperfect.) Shell thin, suborbicular, subspiral, involute, with an ill-defined apex. Length $2\frac{1}{4}$ inches, breadth $1\frac{3}{4}$ inch, and thickness $\frac{3}{4}$ inch. *Loc.* Marbat. *Obs.*—Found together with the foregoing fossils. Species of this genus are very common in Sindh, and almost all that I have seen, which, like the present, are chiefly reduced to their casts, have been more or less filled with *Fascicolites elliptica,* and the spheroidal Alveolina before mentioned. They range from one to four inches long, with a proportionate height, and the border of the columella is denticulated.

Carinaria ?— *Species ?* Conical, reflected. Length $\frac{1}{17}$ inch, breadth at the base $\frac{4}{17}$ inch, slightly compressed laterally, striated horizontally, with a ridge or raphe in front. *Loc.* Marbat. *Obs.*—Found with the foregoing fossils.

Trochus.— *Species ?* (Cast, imperfect.) Height about 4 inches, and breadth at the base 4 inches. Spire consisting of nine or ten whorls. *Loc.* Marbat. Found with the foregoing fossils.

Buccinum.— *Species ?* (Cast, imperfect.) Length $2\frac{3}{4}$ inches, breadth $1\frac{1}{2}$ inch. *Loc.* Marbat. *Obs.*—Found with the foregoing fossils, which were also accompanied by casts of olives, but too imperfect for description.

From the colored agillaceous strata I obtained nothing but a rock-specimen of limestone of a lead blue color, almost entirely composed of small orbitolites, but I did not preserve it, not knowing at the time from whence it came.

Nor did I see anything in the micaceous sandstone worth noting, except a tesselated arrangement of a stratum in the lower part, over which the path passed, leading from Marbat to the base of the table-land. It is on the short plain here which extends outwards from the base of the latter to the border of the torrent bed, and is raised about 30 feet above the level of the sea. At first I thought this was the tiled surface of a floor belonging to some old building, but a few moments' reflection and observation convinced me that it was the cracked surface of the stratum, which must have been formed at the time of its deposit. The cracks had been an inch wide, and had been filled up with a dark ferruginous sand, which contrasted strongly in color with the white coarse-grained quartziferous sand of the stratum generally, and therefore of those parts which it surrounded. This ferruginous deposit or cement had cracked again in its centre, and so the whole of the divisions had become more or less loose and separable. They are of course of various sizes, and of all kinds of polygonal shapes, and about three inches thick: the ferruginous sand not only coats their sides, but their lower surfaces as well, and it is probably owing to the presence of the iron that this remarkable feature has been preserved. It shows us plainly that this part in particular of the sandstone must have been deposited at the level of the sea, where the tide now and then overflowed it (for no cracking could take place under the sea), and that too before the 4000 feet of strata now above it were deposited; and, as the uppermost stratum of the latter contains the remains of animals which must have been deposited in the sea, these cracks farther show that this portion of the sandstone must have gone down at least 4000 feet since they were formed, and have returned to a position higher than that even in which it was first deposited. I took particular care to ascertain the correctness of this by observations made on the spot, and brought away some of the loosened divisions for closer examination; and the total absence of calcareous material in them, connected with their containing particles of mica, and being of the same composition as the sandstone in which they are found, at once places beyond doubt the possibility of their being a subsequent formation. Neither can these divisions, or the sandstone in which they exist, be confounded with any other above it, because there is no other of the kind; and if it had been a portion of the same sandstone disintegrated and re-deposited, it must have contained more or less particles of carbonate of lime, from the detritus of the older rocks, and the sea in which it was re-deposited; for every formation which has taken place subsequently to, above or alongside this sandstone, does contain more or less calcareous material.

I had not time to examine these sandstone strata much, or probably I might have met with some fossils in them.

Having, then, seen the igneous tract at Marbat, and traced the strata of the table-land to its summit, let us now return for a few moments to the granite plain, where we shall find a modern formation, well worthy of our attention, and which we shall have to trace on for some distance, and indentify with similar ones which we have passed, for it will be some way before we can again get a section of the table-land; and in the mean time we must occupy ourselves with the no less important deposits which lie along its base.

Capping the plain of Marbat, the highest part of which I have before stated is about 30 feet above the level of the sea, is a granular deposit, composed chiefly of particles of carbonate of lime, with which are mixed more or less grains of quartz and hornblende, from the igneous rocks on which it reposes. It is about a yard in thickness, and extends in all directions over the plain to within a mile of the sea. It contains a great number of organic remains, consisting chiefly of casts of small Conchacea. This indeed is the fossil character of the deposit. The houses at Marbat are built with it, and some of the headstones of the graves there are made from slabs of it, which will show that it is of considerable consistence. It fills the inland extremities and crevices of the fissures, which I have stated to extend through this plain to the sea, and there contains very large shells; and adherent to the side of the group of granite hills at the bottom of the bay is a large mass of it, the upper part of which is 30 feet above the level of the sea. Here it presents a vast quantity of corals, with gigantic shells of Hippopus, Ostrea, &c. All these shells have lost their animal matter, and are more or less friable and pulverulent. This formation in its more subtle material closely corresponds with the miliolitic deposit at Ras Abu Ashrin, and when we have proceeded a little onwards from the igneous rocks, we shall find its composition and appearance to be almost identical with it, while at Marbat it more resembles that part of the miliolitic deposit which we have seen resting on the dioritic rocks, near the village of Gyren, in the island of Masira.

Between this formation and the water's edge is a coarser deposit, which overlaps the former, and is composed of rounded gravel from the granite rocks, held together by a whiter matrix than that of the first deposit; and, still nearer the sea, a third, still more white, and apparently more recent, the upper surface of which is about 12 feet above the level of high-water mark.

The fossils obtained from this and the foregoing deposits were:—

Lucina ?— (Cast.) Breadth 1 inch, height 1 inch. *Loc.* Marbat, in the miliolitic deposit lying on the granite plain. *Obs.*—There were many other bivalves present, smaller than this, but none so numerous.

Venus.— *V. puerpera vel corbis* (Lam.) mihi. (Specimen imperfect.) Breadth 3 inches, height 3 inches. Cancellated, the lines projecting a a little at their points of decussation. *Loc.* Marbat, in the deposit between the latter and the water's edge.

Ostrea.— *Species?* Inferior valve oval. Length 8 inches, breadth 5 inches. Deep, patulent; muscular impression sub-central, lateral; straight posteriorly, convex anteriorly. Impression of hinge concave rhomboidal, wavy, terminated by a straight border anteriorly, and by an ill-defined one posteriorly. Margin crenulated for a short distance on each side the hinge; afterwards simple, wavy. Upper valve thin anteriorly, thickened posteriorly, with a deep angular longitudinal groove in the centre. *Loc.* Marbat, from the miliolitic deposit at the end of a fissure in the granite plain.

I should also mention another formation here, which is seen on the inner side of the group of granite hills next the base of the table-land. It forms part of a deposit prior to the miliolitic on the granite plain, and is better seen a little further on, for here it only peeps above the sand close to the sea at the part I have mentioned. It consists of a coarse cellular limestone, in which are sparsely scattered rounded portions of hyaline quartz, and particles of other minerals from the igneous rocks, together with a few remnants of small fossilized shells. Its color, which is of a dark brown, like that of moist brown sugar, as well as its appearance, at once characterizes it among the other deposits, and not less so the extreme craggedness into which it wears by the action of the waves. It is sometimes saccharoid, and generally effervesces slowly with acids.

Having described this rock, let us now proceed along the coast; and, leaving the granite hills of Marbat, we cross the bed of the torrent mentioned to the base of the table-land, following which for four miles over a narrow plain between it and the beach, partly obscured by drift-sand, we at length arrive at an abrupt elevation of this plain to 100 feet above the level of the sea, and presenting a sea-cliff of the same height. This cliff is continued on, broken through here and there by a torrent bed, to the village of Takah, about twelve miles distant. Four miles west of Marbat I examined it, and afterwards a rock, called the island of Guena, which is of the same height, close to it, and the geological section of both, from above downwards, is as follows:—

First, five feet of a granular calcareous sandy deposit, like the

miliolite mentioned, in which are imbedded rounded pebbles of the older limestone. Then a narrow stratum of compact, coarse, shelly, impure limestone, of a light whitish color, resting on a little thicker stratum of dark brown limestone, of the kind stated to exist behind the granite hills at Marbat, which, in its turn again, reposes on a compact white limestone, breaking with a conchoidal fracture, and an even surface. The brown limestone here is more saccharoid in its structure than at Marbat, and contains a little magnesia ; in its upper part is sparingly scattered small rounded quartz gravel, from the igneous rocks, and below it presents white spots, which are but large pebbles of compact limestone, from the older formation, now almost indistinguishably blended with it.

When we approach the end of this sea-cliff, which is at Takah, we might expect, as it appears to be all of the same height, to find the same strata again, but instead of this we find a complete absence of them, and in their place an entirely different limestone, which extends to the summit of the cliff. This limestone, which is more or less earthy, and of a white pinkish color, is richly charged with Orbitoides of the following description :—

Orbitoides.— 1st *Species?* Flat, circular, compresed, more or less wavy. Breadth $\frac{8}{17}$ inch, thickness in the centre $\frac{1}{16}$ inch. Gradually sloping to a thin circumference. External surfaces tuberculated towards the middle? Presenting a horizontal plane of rectangular chambers, passing through the centre, with laminiform cells on both sides. *Loc.* cliff at Takah.

——— 2nd *Species?* Circular, doubly convex, terminating in a rim of unequal breadth. Convexities sub-central. Breadth $\frac{5}{17}$ inch, thickness $\frac{2}{17}$ inch. External surfaces tubercled over the convexities. Internally presenting a horizontal line of chambers, passing though the centre, from which white lines of laminiform cells radiate to the circumference. *Loc. idem.*

——— 3rd *Species?* A little larger than the foregoing, but with the rim turned up, like that of a hat. *Loc. idem.*

——— 4th *Species?* The same kind, but one side only presenting the hemispherical elevation. *Loc. idem.*

Operculina.— *Species?* Sub-elliptical, very thin. Length $\frac{3}{17}$ inch, breadth $\frac{5}{24}$ inch. Consisting of two whorls. Chambers apparent externally, long, narrow, and much reflected, increasing in length suddenly after the first whorl. Externally presenting minute tubercles, disposed over the commencement of the whorls, and then following the lines of the chambers. *Loc.* cliff at Takah.

Obs.—The second species is *Lycophris dispansus*, which abounds at Lukput, in Cutch. (Grant's Geol. Cutch. pl. xxiv. fig. 16. Geol. Trans. vol. vi. 4to.) What I have described as several species may be after all but varieties of one animal, for they appear to assume all kinds of shapes. They abound in Sindh, and one extraordinary form of them there resembles two convexo-concave disks, joined together by their convexities. The first species is not improbably a nummulite, as both *Lycophris dispansus* and large nummulites occur together in Cutch, and appear to pass into each other, while my description is chiefly taken from sections and half exposed specimens imbedded in the parent rock. Dr. Carpenter, who has given some beautiful sections of Orbitoides in the Quart. Jour. Geol. Soc. vol. vi. Plates 4—8, considers, page 36, these fossils to be allied "rather to the nummulites than to the orbitolites," and in his concluding paragraph states: "The Foraminiferous character of Orbitoides appears further to be indicated by the presence, in all the species I have examined by sections taken though the centre, of the large globular cavity (fig. 35, a), resembling that which is stated by M. D'Orbigny and Mr. Williamson to be the ordinary form of the first segment of the Foraminifera, whatever may be the form which the compound structure may subsequently present."

The character, however, on which I would place most reliance, in pronouncing these fossils to belong to Foraminifera, is the spiral arrangement of the central plane of cells, which I think not quite so satisfactorily shown not to be the case in fig. 31 of the sections to which I have referred, wherein Dr. Carpenter states, p. 32, the cells may be seen "arranged in regular concentric rows," as one could wish. No doubt it is very difficult to hit upon the centre of this plane in specimens where it is very thin, but until I can do this myself, or see that it has been done by others, I shall not be satisfied that Orbitoides are without this character, which the imperceptible gradations of nummulites into them would *à priori* lead one so strongly to suspect.

Whatever the structure of these fossils may be, or however numerous their varieties and species, their presence at Takah, not far from the centre of the South-east Coast of Arabia, is sufficient proof of the existence of the Nummulitic Series here; though I am ignorant of the exact position in the series which these fossils occupy. Hence we must regard the cliff at Takah, which has only an elevation of 90 feet above the level of the sea, as a part of this formation, and, moreover, we must regard it as a part of the compact white limestone, breaking with a conchoidal fracture, on which some miles back in this cliff we saw the dark brown limestone reposing. The end of the cliff at Takah, that is the part

under consideration, has undergone much disturbance, and, though low, has fallen forward in great square blocks, which present a large quantity of corals in their composition, while the rents in the plain between the base of the table-land, here transformed into mountains, and the sea, a distance of about two miles, bear ample testimony of the distorting forces to which this locality has been subjected. It is opposite Takah, as before stated, that the bed of recent Operculina exists, in twenty-five fathoms water, with a fine sandy bottom, which are identical with that species which forms whole strata almost, in the Nummulitic Series at Măskat. Hundreds of them came up on the grease of the sounding-lead at each throw, and for several miles in extent, when this part of the coast was surveyed.

At Takah, as just mentioned, the sea-cliff ends, and the maritime plain between the base of the high land and the sea sinks from 100 to about 10 feet above the latter ; it also expands westward from this point, for the mountains recede, and give place to a flat area, twenty-two miles long, and from ten to fifteen miles deep in the centre: this is called Dofar, and is the most fertile district on the coast. Over this plain is spread a continuation of the miliolitic deposit, which we have seen topping the plain at Marbat, and the low cliff just passed, but it is more uniform in its composition, and more free from dark particles of the igneous rocks; hence it closely resembles the miliolite at Ras Abu Ashrin. On it are the remains of several towns, one of which, called El Bălăd, I have described.* They were built of this freestone, and they contain a vast number of columns, ornamented in arabesque, which have nearly lost their figured surfaces where exposed to the weather. This deposit seems to average about 10 or 12 feet in depth. In many parts of it there are extensive cracks, or *khors* as they are locally called, some close to the beach, which are always full to the brim of fresh water; that, for instance, at El Bălăd, is more than two miles long, and in one part about 100 yards broad, and flows over the beach, though no stream can be seen running into it. It is the presence of these *khors*, and the looseness of the soil, which renders Dofar so fertile, in comparison with the rest of the coast.

Passing along the cord, or sea shore of this half-moon-shaped plain, we at length arrive at its opposite or western extremity, where the high land, as at Takah, comes out again to within nearly the same distance of the sea; we also find this end of the plain elevated again to about the same height as at Takah, and consequently a sea-cliff

* Journal Royal Geograph. Soc. Vol. VI. Trans. Bombay Geograph. Soc. Vol. VII.

in front of it, which presents a similar geological section to that examined four miles west of Marbat; commencing from below upwards, it is as follows:—

At high-water-mark, or a little lower, is a white compact limestone, of a fine structure, and breaking with a conchoidal fracture, on which rests the dark brown limestone first seen beside the granite hills at Marbat, close to the sea; this is ten and a half feet thick here, and presents, in its upper part, a stratum, two and half feet thick, of large rounded pebbles; these pebbles are of compact white limestone, and are from the older formations. On them lies a bed of large oysters, one and a half feet thick, and with these the color of the limestone changes from dark brown to a greenish reddish dirty white; it also now becomes shelly, and presents radiated masses of columnar coral, with a great number of casts of smallish bivalve shells (Conchacea et Ostrea); further it is rendered more or less impure, and derives its reddish color from the presence of red argillaceous earth, disseminated here and there throughout the whole mass; this stratum, including the bed of oysters, is seven and a half feet thick. Next above it comes seven feet of still more impure limestone, composed chiefly of small rounded gravel from the older limestone, mixed with an increased quantity of red argillaceous earth, which gives the whole stratum a red color. And on it again comes twenty feet of white shelly limestone, similar to that first described. This forms the section of the cliff, and against the upper part of the dark brown limestone and lower white shelly limestone rests the miliolitic deposit of Dofar, six or eight feet above high-water-mark, filling many holes in the former, which have been made by lithodomous animals, and containing oysters of the same kind as those of a bed close by. Walking inland from the cliff, however, for about a mile, we come to fifty feet of limestone gravel, and pieces of flint, imbedded in red argillaceous earth, similar to that mentioned, and this is capped again by five feet of limestone pebbles and flints of a large kind, with less red earth. These deposits add to the thickness of the section, but will be found by-and-bye to depend probably on local causes.

Hence we see that here, about the centre of the South-east Coast of Arabia, we not only have the miliolite, but we have, in addition, another littoral deposit, viz. the compact brown limestone, with the whiter shelly limestone above it, making in all about fifty feet in thickness of a deposit totally different from, and lying inferior to the miliolite; and that it rests on a compact limestone, belonging to the older formation, must be inferred from the presence of the nummulites? and orbitoides in the cliff at Takah, on which a few miles back the brown lime-

stone is seen to repose, but this will become more evident as we proceed.

I have stated that the mountains advance towards the coast here, but the coast-line also turns here from running east and west, to south, and then south-east, a little way before it resumes its original direction; that is it is reflected to form a little bay here, called the Bay of Resut; and hence the maritime lowland, which is narrowed at this end of Dofar, is widened again, not in this instance by the mountains receding from the shore, but by an advancement of the lowland upon the sea, and with this advancement the lowland also is bordered externally by a ridge, which in one part is 700 feet high, and scarped upon the sea throughout. Thus, then, we have a valley between the sea-cliff of this ridge and the mountains; a small promontory formed by the end of the ridge, called Ras Resut, and inside it the bay mentioned of the same name. Now into this bay we have the opening of a torrent bed a mile wide, coming not only from the valley itself, but from among the mountains, and the section of the cliff just given is taken from the inner corner of the opening of this torrent bed upon the sea. This, then, accounts for the additional strata of red earth, flints, and pebbles, before mentioned, and which we did not see in the section taken four miles west of Marbat, where the cliff is within two miles of the base of the mountains, and on a straight part of the coast, far removed from the influence of any great torrent deposit. We therefore must not include in this littoral deposit this 50 feet of red earth, pebbles, &c., because it is evidently a local accumulation.

Passing across the sandy beach which lies in front, and in the dry weather closes the mouth of this torrent bed, we arrive at its opposite or external corner, which is close to the base of the ridge mentioned, and that of the small promontory which shelters the bay. This corner, like the other, presents a low cliff, consisting of little more than the dark brown limestone we saw on the other side, and which, running along the base of the promontory parallel to the sea, and scarped upon it for about eight feet, is washed by the waves into that extreme cragginess so characteristic of the stratum in other parts. This deposit rises no higher, while the height of the promontory is two or three hundred feet above the sea at its base, and two hundred at its extremity. Here, then, we have compact white limestone rising up to form the ridge of the promontory, while we have the dark brown limestone remaining in a horizontal line at its base. Nothing, therefore, can be more plain than that this white compact limestone, which we have seen all along underlying the dark brown limestone, is a part of another series, and the presence of

the nummulites? and orbitoides at Takah, as before stated, shows that this is the Nummulitic Series.

Hence there are here, nearly in the centre of the South-east Coast of Arabia, two distinct littoral formations, later than the white limestone strata forming the tops of the mountains; and as this part of the coast, in which they are so evidently seen, is also circumscribed by natural limits, I will briefly recapitulate what I have stated respecting it, before proceding further.

We have just seen that there are two bays here, which look towards each other, the one called Marbat, the other Resut; and they are separated by forty miles of coast, running E. and W., which is straight, and backed by the table-land the whole way. At Marbat we have seen a plain of igneous rocks, and the precipitous face of the table-land, which lies behind them; and in the bottom of the bay we have seen a dark brown compact limestone formation peeping above the sand close to the sea on the inner side of the granite hills, at the base of the table-land; a miliolitic deposit capping the granitic plain, and a still more modern deposit towards its circumference. We have also seen, four miles west of Marbat, the cliff of the maritime plain there, narrow, raised 100 feet above the sea, and presenting a dark brown, rough limestone, resting on a compact white one breaking with a conchoidal fracture; above the brown limestone, a stratum of a lighter color, but still compact, and then five feet of the miliolite, with rolled limestone pebbles of the older formation. Following this cliff for a certain distance, we have found the compact white limestone at the base rising to 90 feet high at Takah, and denuded of the other strata, but giving us decided evidence of its nummulitic character, by the presence of nummulites? and orbitoides. Then we have the miliolitic deposit spreading out over the district of Dofar; and at Resut the dark brown limestone again forming part of the sea-cliff, and resting, as before, on the compact white limestone, which, in the outer half of the bay, rises from below it to form the upper part of the promontory of Resut. Above the dark brown limestone here also we have an impure white compact limestone, as in the cliffs between Marbat and Takah; and adhering to the side of the cliff, which is partly formed by these two in the Bay of Resut, a portion of the miliolitic deposit. Thus we have the same kind of littoral deposits throughout the straight part of this portion of the coast, and the same at the bays of Resut and Marbat, but with this difference, that the fundamental rock of the former is limestone, and that of the latter granite. There is an entire absence of igneous rocks at Resut, whereas at Marbat there are hardly anything else.

From Ras Resut, which at its extremity is about 200 feet high, a sea-cliff is continued on for twenty-three miles, to the base of the great promontory called Ras Sejăr, which is formed by the advancement of the mountainous tract upon the sea. This cliff I had not an opportunity of examining much, as it is perpendicular, and rises directly out of the water. What I did observe, however, is interesting.

I have just stated that there is an entire absence of igneous rocks at Resut, but, though this is the case, they are not far distant, one would think, for not only the limestone of the cape is shivered into atoms, and rendered pink by heat, but six miles further on the base of the cliff is similarly fractured where it is 700 feet high. This point is called Ras Hammar, and is the maximum altitude of the cliff. Ras Hammar is composed of compact white limestone above, and of the comminutely fractured limestone mentioned below, but I am ignorant of what lies between, further than that the whole is white calcareous strata, and that among these there are some of a marly cretaceous nature, from which the Bedouins cut their pipes, similar to that at Marbat. The brecciated limestone, for such it is, from the crevices having been filled up by a cement, and that too of the same material, is of a dense compact fine structure, lithographic, but breaking with a splintery fracture, heavy and hard, and of a light grey color. By a rough analysis, it contains from 12 to 15 per cent. of magnesia. Its specific gravity is 3.3. It scarcely effervesces with acids until pulverized, and its great weight and hardness appear to be owing to the presence of silex.

In this limestone is a cavern, similar to those which abound in the mountains, and one of which I visited near Takah. Its base is just above high-water-mark, and its roof is about 30 feet high, and hung with stalactites, not of magnesian limestone, but of sulphate of lime. From the face of the cliff presenting innumerable excavations of lithodomous animals, on a parallel with the upper part of the roof, and the brecciated state of the limestone, it is probable that this cavern commenced with the latter, and was subsequently washed out by the waves, while the cliff was rising from the sea. That which I visited, near Takah, is in the mountains, and I have given a description of it in this Journal.* It was inhabited, and is about 150 feet span and 50 feet high, (not yards, as stated from oversight in the description to which I have referred,) and 30 yards deep. Its roof is also smoothed, and hung with thick stalactites : another cavern, of equal dimensions, close by, had fallen in. We saw some from the vessel in the elevated scarps of the mountains in different localities, which, judging from the size

* Vol. III. No. xiv. p. 253.

they appeared at the distance we were from them, must be of enormous dimensions. They form the principal habitations of the Bedouins of these parts, and descend from father to son as hereditary property.

From Ras Hammar we pass along the remaining part of this cliff to the base of Ras Sejär, which it joins after a distance of twenty-five miles from Ras Resut; diminishing gradually in height after Ras Hammar, until it arrives at this point. Ras Sejär is the largest and highest promontory on this coast: it is an advancement upon the sea of the great mountainous tract which from this point south-westwards, for a distance of sixty miles, presents no maritime plain whatever, but descends directly to the sea in long slopes or in precipitous steps. The ridge of the promontory has been computed by trigonometrical measurement to be 3380 feet above the level of the sea, and the bluff at its extremity 2770 feet. The eastern side is scarped perpendicularly for 800 feet, and the strata, which are composed of white and grey limestone, are disposed horizontally. At one part of the talus of this cliff is a little island, on which exists the dark brown limestone and miliolitic deposits seen in Dofar, but the latter is much finer in structure. After this I did not recognise the brown limestone, though doubtlessly it or its representative exists here and there throughout this coast.

The south-eastern side of Ras Sejär, which is parallel with the coast, and its south-western extremity, the highest point of the cape, present an almost vertical scarp, in which the strata are seen to dip towards the north-east; while on the south-western side, the same horizontality is seen which we observed on the eastern side, but with a scarp rising by high precipices and narrow shelves to the ridge of the promontory, which I have before stated to be 3380 feet above the level of the sea. At the point where the coast line turns from running N. E. and S. W. to about N. W., for a short distance, is the great bluff of Ras Sejär, and the following is its geological section, from below upwards:—

The first 25 feet above the sea is composed of a fine-grained micaceous sandstone or quartzite, of a blueish grey color, thinly stratified, and breaking with a rough fracture across the planes of stratification. It is weathered into holes indicative of the presence of organic remains, and in some parts is veined with white quartz. There is hardly any difference, except in color, between it and the upper part of the micaceous sandstone at Marbat. On this rests 175 feet of variegated argillaceous strata, principally of a red color, containing many fossils,

and above all again the white limestone strata, which, deducting the thickness of the sandstone and colored deposit from the total height of the bluff, amounts to 2570 feet.

Having on the base of this section measured with my eye, as carefully as I could, the height of the lower projection of the bluff above the sea, for I had no means of obtaining it in any other way, I find, when I come to multiply this on the outlines of the bluff, which I made at different distances, that the latter does not amount to more than 1950 feet above the sea, which is 820 feet less than it was computed to be by trigonometrical measurement: possibly, and not improbably, from the place where the base was measured, the angle was taken from a point much higher than the summit of the real bluff. The height of the limestone bluff at the island of Hăllăniyah being 1645 feet, and the estimated thickness of the limestone at Marbat about 1800 feet, together with the trigonometrical measurement of the scarp of the next promontory we shall come to, which is limestone from the water's edge to its summit, being 1900 feet, seems also to indicate, from the thickness of the limestone at these places, that my measurement of the bluff at Ras Sejăr is more correct than that obtained by triangulation, but probably from the reason above mentioned.

I collected no fossils from Ras Sejăr, beyond some small imperfect specimens of the genus Turritella? from the colored strata.

It is to the blue grey sandstone of this promontory that the late Capt. Newbold alluded when hinting at the origin of the quartzite pebbles in the conglomerate underlying the nummulitic strata at Măskat, and resting on the euphotide and diorite of that locality.* A little further in from the extremity of Ras Sejăr on the south-west side, where the precipitous part of the promontory is much higher than at the cape, this sandstone is also raised to 300 feet above the level of the sea; and my impression is that here, as well as at Marbat, its strata are not parallel with those immediately overlying them, but dip towards the north; still I am far from being certain that this is the case.

As on the other parts of the coast, so on the lower part of Ras Sejăr, there is a thick line of the miliolitic deposit, adhering to the side of the cliff, 150 to 200 feet above the level of the sea. On the south-western side of the promontory I think I also saw it again, reaching down to the water, for there are dwellings excavated there in a yellowish white deposit, which can only be this or micaceous sandstone, and it is not likely to be the latter, from its hardness and dark color. At all events, it exists again at Rakot, a little village at the mouth of a

* This Journal, Vol. III. Part ii. p. 27.

ravine-like valley, seven miles to the westward of Ras Sejär. Here it is of considerable height and thickness, and of a finer structure than any on the coast. While I was knocking off some specimens, the Bedouins who were with me asked me if I wanted any *khat*, which means "white writing chalk," because, if I did, it was to be found in the upper part of Ras Sejär. From this it would appear that the chalky stratum we have met with here and there from the island of Hammar el Nafur onwards also exists on the top of this cape.

Between the last named village and a town called Damkot, some miles further on, are more dwellings, close to the sea, at the bottom of the slope of the high land. These also appear to be cut out of the miliolitic deposit: the place is called Jādāb. The high land also presents a more extended tabular outline here than hitherto met with, and continues to do so on to the neighbourhood of Damkot, forty-five miles from Ras Sejär, where it becomes broken, and thrown up into mountainous peaks again, the summits of which are about 3000 feet above the sea. This form of the coast continues on for some distance, viz. to the opening of a valley called Shagot, where the coast-line turns to the south, and the scarped mountainous ridge, here precepitous upon the sea, pursues its original course south-west, under the name of the Fattak range. A lowland shore, therefore, commences at this point, which, as the coast trends southward, is continued on till it meets the lower hills of a mountainous ridge called the Fartak range, a distance of forty miles. Between these two points, viz. the Fattak and the Fartak ranges, it extends inland or south-westward as far as the eye can reach, and is the only part of this coast where the mountain ridges which face the south-east appear to be separated by any great interval. The sea-cliff of this lowland varies with the height of the lowland itself, but seldom reaches 100 feet. I had an opportunity of examining it about its centre, where its cliff is 60 feet high, and the following is the section from above downwards :—

First six feet of a coarse sub-cellular limestone, breaking with a rough fracture, and of a light brown color, resembling in structure the dark brown limestone of Resut. This becomes mottled with red about its lower part, and passes into a red argillaceous chalky deposit, which at the water's edge becomes of a greenish white color, uniform in its dark appearance and structure, and of a moderate hardness. Here also, 15 feet above high-water-mark, is a line of the miliolitic deposit, adhering to the side of the cliff, and composed of the calcareous sandy material before noticed, in which are imbedded a number of shells.

There is a pebbly beach at this place, composed of rounded pieces

of more or less compact limestone, and concretionary flints ; also here and there a large piece of extremely fine limestone, of a lithographic structure, from one to three feet in diameter, probably the altered remains of fossillized madrepore. I saw no pebbles or traces of igneous rocks here; indeed this part of the coast seems to have undergone less disturbance than any other, although the line of miliolitic deposit shows that, like the rest, it is experiencing gradual elevation.

The cliff of which this is a section is more or less continuous from this point on to the lower hills of the Fartak range, which commences in an angle close to the sea. One side of it runs inland and south-westwards, which is the grand direction of the range, and the other southwards, to end in the cape called Ras Fartak. This angle is about fourteen miles from the cape. Here the strata of the lowland cliff also become elevated, broken up, and confused, and this confusion extends to within six miles of the cape, where the irregularity ceases, and the uppermost stratum of the white limestone series can be seen emerging from the water, and pursuing its course to the top of the escarpment, which is 1900 feet above the level of the sea, after which it assumes a horizontal direction, and continues on to the summit of the cape: in this way stratum after stratum of this cliff may be seen rising from beneath the water, until the lowest runs almost parallel with it; so that no better place could be visited than this for examining deliberately and without interruption the strata of which this great limestone formation is composed. I had only an opportunity of visiting one part of it, and this was where the strata had become horizontal, and where a portion of the face of the cliff, having fallen off, enabled me to obtain from the talus thus formed a knowledge of a good extent of the lower part of it. It consists of more or less compact, more or less cavernous, and more or less saccharoid white limestone, which again is more or less mottled, or rather veined with dark brown saccharoid magnesian limestone. I saw no traces of fossils in it, except a few minute species of Foraminifera, of the genus Alveolina (d'Orbigny). In one part the rock is entirely saccharoid, sparkling, uniform in structure, and of a grey color, in fact dolomitic, and on a rough analysis yields 16.4 per cent. of magnesia, with a specific gravity of 3.07. It is an interesting fact, bearing, perhaps, upon the formation of dolomite, that the dark veined portions here are of magnesian limestone, effervescing feebly with acids, while the whiter portions bubble up as usual when touched with them.

As we approach this extremity of the Fartak range, which forms the cape called Ras Fartak, and which is also the south-western limit of

the great bay of El Kammar, a reddish tint makes its appearance at the base of the cliff, close to the water, and on turning the corner we observe, by the truncated end of the cape, that this is the commencement of the argillaceous strata, which, rising towards the west at an angle of 45°, reach an altitude of from 1000 to 1200 feet on the opposite side of the cape. The base of the cape, I should state, is much in advance of the upper portion, and this advanced part consists of the series mentioned, to the geological section of which let us now turn our attention, having considered that of the white limestone strata which lie above and behind it, on the eastern side of the cape. Commencing from the summit of this advanced portion, and proceeding downwards, (though this section was obtained by following the base of the cape from east to west, and noting the strata as they emerge successively from the sea,) we have at first 300 feet of fine compact limestone, of a light violet color, breaking with a smooth conchoidal fracture, and containing small Orbitolites, and other fossils. Then a wide stratum (say 50 feet thick) of a red argillaceous limestone, presenting the same kind of fossils, but more numerous, with Echinodermata. Next follows 20 feet of greenish yellow argillo-calcareous strata, splitting into thin laminæ, on which are seen the remains of a few minute bivalve shells, and marks similar to those made on mud by small crabs and annelides. After this comes 10 feet of a red, ferruginous-looking, argillaceous limestone, and, following it, a stratum of a bluish grey argillo-calcareous siliceous shale, exhibiting, where exposed to the atmosphere, a jointed structure, and thick laminæ. This is succeeded by 30 feet of blue marl, compact above, and soft below, in which are remains of Echinodermata, Ostracea of the genus Exogyra, and pyrites. Next comes 300 feet of impure limestone, compact, and of a pinkish grey color, the lowest hundred feet of which (the only part I examined) is almost wholly composed of small Orbitolites, with the remains of a few small Echinodermata. This is the last stratum towards the west which emerges from the sea : it is opposite the little village of Khaisêt. After this, the remaining part of the extremity of the cape is confronted by a narrow sandy beach, from beneath and behind which the colored strata continue to rise in the same manner as from the sea, to the extent of 500 feet in thickness : this 500 feet is composed of impure limestone, compact, and of a dark red color, and ferruginous aspect ; fossiliferous, and abounding in large cavities and fissures, which appear to have been caused by some subterranean force, for the rock has been shattered throughout, and cemented together again by its own material. Among the more thinly stratified deposits of the upper part

of these colored strata are bands of brighter colors, which have not been mentioned: these consist of much the same kind of material as that with which they are in contact, or form a part, and give to the whole a variegated appearance when near, but, when viewed at a distance, are lost in the prevailing red color of this series.

The following are the fossils which I gathered from these strata here and at Ras Sharwên, the next large cape, which is sixty miles further west, but a part of the same formation:—

ZOOPHYTA.

Astrea.— *A. textilis.* Goldf. (Tab. 23, fig 3.) mihi. Hemispheric, covered with conical projections, which are more prominent in the upper part than towards the base; and marked with striæ, which radiate from their summits. Horizontal diameter $\frac{8}{17}$ inch. *Loc.* Ras Fartak, from the pinkish grey limestone.

Orbitolites.— 1st *Species?* Conical, obtuse, excavated. Breadth $\frac{2}{17}$ inch, height $\frac{1}{17}$ inch. External surface presenting striæ in concentric rings; internal surface presenting striæ radiating from the centre to the circumference. Structure solid, composed of minute cells. *Loc.* Ras Fartak, chiefly in the pinkish grey limestone.

——— 2nd *Species?* Conical, acute, deeply excavated. Breadth $\frac{1}{8}$ inch, height $\frac{1}{17}$ inch. External surface presenting striæ in concentric rings. Structure solid, composed of minute cells. *Loc. idem.*

——— 3rd *Species?* Flat, circular, wavy, thick; diminishing in thickness towards the circumference. Breadth $\frac{3}{17}$ inch, thickness $\frac{1}{37}$ inch. *Loc. idem.*

——— 4th *Species?* Discoidal, flat, and extremely thin. Breadth $\frac{2}{17}$ inch. External surface presenting striæ in concentric rings. *Loc.* Upper red stratum, Ras Fartak.

ECHINODERMATA.

Spatangus.— 1st *Species?* (Spec. imperfect.) Oval. Length nearly $1\frac{1}{2}$ inch, breadth anteriorly $1\frac{1}{2}$ inch. Truncated posteriorly, slightly grooved anteriorly, ridged posteriorly. Ambulacra five, sub-petaloid, all the same length, in deep furrows. Vent sub-dorsal. Base impecfect. *Loc.* Ras Sharwên.

——— 2nd *Species?* Thick, round, heart-shaped. Length $1\frac{3}{4}$ inch, breadth anteriorly $1\frac{6}{17}$ inch, and height 1 inch. Grooved antero-dorsally. Ambulacra five, two anterior shortest. Buccal orifice sub-terminal, simple. Base not carinated. Vent sub-dorsal. Genital pores four. *Loc. idem. Obs.*—There is another specimen similar to this, and from the same locality, $1\frac{1}{2}$ inch long.

Spatangus.— 3rd *Species?* Thick, round, heart-shaped, like the foregoing, but much smaller. Length $\frac{1}{12}$ inch, breadth anteriorly $\frac{9}{12}$ inch, and height $\frac{6}{12}$ inch. *Loc. idem.*

Discoidea, (Gr.)— 1st *Species?* Sub-pentagonal, excavated. Breadth 2 inches, height 1 inch. Ambulacra extending to the buccal orifice, which is median. Vent sub-marginal, pear-shaped, convex posteriorly. Genital pores five. *Loc.* Ras Sharwên.

——— 2nd *Species?* Conical, circular, elongated towards the apex, which is acute. Breadth $1\frac{7}{12}$ inch, height $\frac{9}{12}$ inch. Ambulacra, buccal orifice, vent, and genital pores the same as in the foregoing. *Loc. idem.*

——— 3rd *Species?* Sub-pentagonal, conical. Breadth $1\frac{1}{3}$ inch, height $\frac{8}{12}$ inch. Buccal orifice, vent, &c. the same as in the foregoing species. *Loc. idem.*

——— 4th *Species?* Sub-pentagonal, convex. Breadth $1\frac{4}{12}$ inch, height $\frac{5}{12}$ inch. Buccal orifice, vent, &c. the same as in the foregoing species. *Loc. idem.*

——— 5th *Species?* Conical. Breadth $1\frac{1}{2}$ inch, height $\frac{8}{12}$ inch. Vent sub-marginal, longitudinal, pointed at each extremity. Buccal orifice, pores, &c. as in the foregoing species. *Loc. idem.*

——— 6th *Species?* Circular, convex. Breadth $1\frac{4}{12}$ inch, height $\frac{5}{12}$ inch. Buccal orifice, vent, genital pores, &c. the same as in the last. *Loc. idem.*

——— 7th *Species?* Circular, depressed. Breadth $1\frac{4}{12}$ inch, height $\frac{4}{12}$ inch. Buccal orifice, vent, genital pores &c. the same as in the two last species. *Loc. idem.*

Pygaster, (Ag.)— *Species?* (Specimen imperfect.) Small, circular, thick, convex. Breadth $\frac{7}{12}$ inch, height $\frac{9}{12}$ inch. Slightly excavated. Ambulacra five, narrow, extending to the buccal orifice, each presenting a double row of small tubercles. Inter-ambulacral spaces furnished with a double row of large tubercles, each tubercle sunk within an elevated ring, and the latter bordered on both sides by a small circle of tubercles. Buccal orifice median. Vent pear-shaped, margino-dorsal, longitudinal, round posteriorly. Genital pores five. *Loc.* Ras Fartak.

Echinus.— 1st *Species?* Circular, depressed, slightly excavated. Breadth $1\frac{4}{12}$ inch, height $\frac{5}{12}$ inch. Tubercles small throughout. Ambulacra narrow, and extending to the buccal orifice, which is median; their extremities widely separated at the vent, which is medio-dorsal. *Loc. idem.*

——— 2nd *Species?* (Spec. imperfect.) Hemispheric, circular. Breadth $1\frac{1}{12}$ inch, height $\frac{1}{12}$ inch. Tubercles small throughout. Am-

bulacra five, rather broad, bordered by four lines, or two double series of pores, extending to the buccal orifice, which is median; their extremities widely separated at the vent, which is medio-dorsal. *Loc. idem.*

Diadema, (Gr.)— 1st *Species?* Circular, depressed, slightly excavated. Breadth $1\frac{1}{2}$ inch, height $\frac{1}{2}$ inch. Tubercles small, perforated. Ambulacra bordered on each side by four lines of pores, extending to the buccal orifice, which is large and median; their extremities widely separated at the vent, which is medio-dorsal. Vent broken. *Loc. idem.*

——— 2nd *Species?* Circular, depressed, slightly excavated. Breadth $1\frac{1}{4}$ inch, height $\frac{5}{12}$ inch. Tubercles large, perforated, almost all of the same size, sub-equidistant, and in vertical lines. Ambulacra bordered by two lines of pores, sinuous, extending to the buccal orifice, which is large and median, and widely separated at the vent, which is medio-dorsal. Vent broken. *Loc. idem.*

Salenia, (Gr. et Ag.)— 1st *Species?* Circular, thick, convex. Breadth $1\frac{1}{12}$ inch, height $\frac{8}{12}$ inch. Two vertical lines of large tubercles in each inter-ambulacral space, four tubercles in each line, imperforate. *Loc. idem.* Found in the pinkish grey limestone.

——— 2nd *Species?* Circular, thick, convex. Breadth $\frac{9}{12}$ inch, height $\frac{1}{2}$ inch. Two vertical lines of large tubercles in each ambulacral space, four tubercles in each line. *Loc. idem. Obs.*—The only difference which I can distinguish between these two specimens, excepting in size, is, that the plate resting on the dorsal extremity of the ambulacral space is concave in the centre in the latter species, and pointed in the former one. For a further description of Salenia, see Mongraphies d'Echinodermes, par Louis Agassiz, 1838; and for the genital plates of these two species see Tab. 1, figs. 1 and 22, respectively. The specimens above noticed are much worn and imperfect.

——— 3rd *Species?* Smaller than the foregoing, circular, compressed. Breadth $\frac{8}{12}$ inch, height $\frac{5}{12}$ inch. Three large tubercles in each line. Resembles the last specimen described in the form of its genital plates. *Loc. idem.*

CONCHIFERA.

Tubicola.— *Species?* Tube cordiform, or subcircular, simple; smooth internally, crenulated externally; dilating gradually from a small orifice to $\frac{6}{12}$ inch in diameter, and then expanding suddenly. Wall composed of successive additions, imbricated; internally presenting minute parallel longitudinal lines, running throughout. *Loc.* Ras Fartak, in the dark red ferruginous limestone. *Obs.*—A transverse section of the dilated part

gives a deep crenulated margin, presenting angular costæ and circular intervals, within which are several layers of the same form, (10—12), and white lines rading from the internal margin, which is even, to the circumference. These are the lines which appear longitudinally on the inner side of the tube. Tubes 3 to 4 inches long.

Isocardium.— 1st *Species?* (Cast.) Breadth $2\frac{5}{17}$ inches, height $2\frac{1}{2}$ inches, and depth $2\frac{5}{17}$ inches. Umbos $\frac{2}{17}$ inch apart. *Loc.* Ras Sharwên.

——— 2nd *Species?* (Cast.) Breadth $1\frac{1}{2}$ inch, depth $1\frac{1}{4}$ inch, height a little greater than the breadth. Presenting thin striæ on the surface. *Loc. idem.*

——— 3rd *Species?* (Cast.) Breadth $1\frac{2}{17}$ inch, depth 1 inch. Smooth. *Loc. idem.*

——— 4th *Species?* (Cast.) Breadth $\frac{9}{17}$ inch, height $\frac{9}{17}$ inch. *Loc. idem.*

Cardium.— *Species?* (Cast.) Breadth $\frac{9}{17}$ inch, height $\frac{9}{17}$ inch. Costæ few, and wide apart. *Loc. idem.*

Pecten quinquicostata, Sow.— mihi. (Inferior valve?) Breadth $\frac{6}{17}$ inch, height $\frac{6}{17}$ inch, depth $\frac{3}{17}$ inch. Margin hexangular; costæ prominent, formed by three narrow ridges, and the intervals by three broader ones. *Loc. idem.*

——— 2nd *Species?* (Inferior valve). Breadth $\frac{9}{17}$ inch, height $\frac{9}{17}$ inch, and depth $\frac{3}{17}$ inch. Margin hexangular; penticostate, a single wide ridge forming the prominent ribs, and two smaller ones occupying the intervals. *Loc. idem.*

——— 3rd *Species?* (Inferior valve.) Shell deep. Breadth 1 inch, and height $1\frac{3}{4}$ inch. Margin sub-hexangular, sub-quinquicostate, costæ narrow, regular. *Loc. idem.*

Ostrea.— *Species?* (Lower valve, imperfect.) Ovato-acuminated. Plicated, plaits radiating from an indistinct sharp umbo; striated concentrically, striæ lamellose, and imbricated towards the border, the latter crenulated. Length $3\frac{1}{2}$ inches, breadth $1\frac{1}{2}$ inch. *Loc. idem.*

Exogyra.— *E. flabellata,* Goldf. (Tab. 87, Fig. 6.) mihi. *Loc.* Fartak. *Obs.*—These abound in the blue marly stratum, and are of various sizes. The largest found is $2\frac{3}{4}$ inches long, and $2\frac{1}{4}$ broad, and the smallest 1 inch long, and of proportionate breadth.

GASTEROPODA.

Solarium.— *Species?* Breadth $\frac{1}{17}$ inch. *Loc.* Ras Fartak, in the deep red ferruginous limestone.

Turritella.— 1st *Species?* Slender. Length $1\frac{1}{4}$ inch. Whorls 12,

10—11 costæ in each whorl. *Loc.* Ras Fartak, red ferruginous limestone.

Turritella.— 2nd *Species?* Slender. Length $1\frac{1}{4}$ inch. Whorls 18—20, three costæ in each whorl. *Loc. idem.*

Ammonites.— *Species?* A small portion of the whorl, $\frac{1}{4}$ inch wide; just enough to show that the suture is sinuous. *Loc.* Ras Sharwên.

Thus we see that the advanced or lower half of Ras Fartak is composed of marls, clays, sandy shales, and impure limestone strata, containing the above fossils, and of a variety of colors, but principally red, terminating above in violet-colored and almost white limestone. We have also seen, when facing this cape, that the strata of the range, of which it is the extremity, dip from west to east, and that the uppermost of the red or colored series, which is not more than 200 feet above the level of the sea on the east, is 1000—1200 feet above it on the west side of the cape. Passing on to the white limestone behind and above these strata, we find the latter denuded for some distance in from their upper edge, both on their southern and western sides, and not continuous with the white strata, as at Ras Sejăr, and at Marbat. This denudation of the upper part of the colored strata, and position of the white limestone series, I could not understand, until, from my sketches of the cape on different sides, I perceived that the strata, both white and red, of the range, dipped not only towards the east, but towards the north. We have already seen them at the extremity of the cape dipping from west to east. Hence, when we come to connect the inclination of all these strata with the existence of an argillaceous deposit about their centre, we cannot be surprised to find that the upper half has slid towards the north-east, and left the whole of the lower or colored strata in advance, which is the case; and this not only accounts for our not seeing the red strata at the bottom of the great scarp which faces the eastern side of the range, towards the Bay of El Kammar, but also for the presence of the sub-range of mountains which exists on its western side.

Difficult as it would have been to have joined these two series with the absence of the micaceous sandstone, and to have accounted for their relative position at this point, without having seen the inclination of the strata, yet the existence of Orbitolites in the white limestone at Marbat, and their abundance throughout the colored strata here, is sufficient to connect the two; and if any further proof be necessary, the finding of a piece of blue limestone at Marbat, almost entirely composed of small Orbitolites, and identical with the pinkish grey limestone of the same kind here, at once identifies the colored strata of both places, and establishes the position of the colored strata of Ras Fartak.

It is remarkable here, however, that the colored strata should be so expanded, and that the micaceous sandstone should not appear.

Thus we see that there are 1900 feet of white limestone strata in the cliff on the eastern side of the Fartak range, and from 1000 to 1200 feet of colored strata forming the advanced part of the cape, and that of the western side of the range. The additional height, therefore, of the main ridge, which has been computed by triangulation to be 2500 feet above the sea, must be accounted for by the inclination of the strata; for although the base of the white limestone is about the level of the sea on its eastern side, it must neverthless, from the dip of the strata in this direction, be elevated for some hundreds of feet above the sea, where it rests on the colored strata on the western side of the range.

Before leaving Ras Fartak, I should state that the pinkish grey limestone, which is filled with small Orbitolites, and which rises from the sea just opposite the little village of Khaisêt, is perforated by the holes of lithodomous animals 30 feet above the level of the sea, and adherent to its side at the same height is a band of the miliolitic deposit mentioned, containing shells, which are in a white pulverulent state, and pieces of the adjoining rocks. This deposit, though not very compact, is sufficiently tenacious to form a building stone, of which the little tower now in ruins on the top of this limestone, which forms a conical hill here, was composed.

From Ras Fartak south-westwards, the coast line forms an obtuse angle with that just passed, and for some distance presents no cliff, but a low sandy shore, reaching back to that part of the Fartak range which I have before stated to run south-west. This sandy shore, which reaches inland for about six miles, continues along the coast for twenty-five miles, when it is limited by a tract of low rocky limestone mountains, which extend outwards from the range just mentioned. I should here state that the mountainous tract of this part of the coast, commencing with the Fartak range, is continuous on to the Yaffai mountains, at Bāb el Mandeb, with the exception of three great valleys, which here and there open upon the sea. The point which limits this low shore is called Ras Darjah; it is about 300 feet high, and composed of limestone. The following is a brief description of the cliff close to it, from above downwards, viz. pink, grey, white, and yellow compact limestone, in parallel strata from three to twelve feet thick, with here and there large round concretionary flints, peeling off in concentric layers. Some of the strata are friable, loose, and gritty, not unlike those at Hammar el Nafur and Ras Kariat, 432 miles off, and in like manner also contain a great number of small Echinodermata of the following kinds:—

Echinocyamus Annonii, Mirian, mihi. (Tab. 27, figs. 37—40. Ag. Mon. d'Echinodermes.) Length $\frac{11}{24}$ inch, breadth $\frac{10}{24}$ inch, and thickness $\frac{3}{24}$ inch. Vent a little distance from the margin. *Loc.* Ras Darjah.

E. alpinus, Ag., mihi. (Tab. 27, figs. 41—43. Loc. cit.) Length $\frac{10}{24}$ inch, breadth $\frac{3}{24}$ inch, and thickness $\frac{3}{24}$ inch. *Loc. idem.*

Obs.—Of this fossil Agassiz states, p. 135: "Mais ce qui rend surtout cette espèce intéressante, c'est son gisement. Je n'en connais que deux exemplaires qui font partie du Musée de Berne; ils ont été recueillis dans la chaîne des Alpes Suisses, à Burgenberg, près Stanz (canton d'Unterwalden), dans une sorte de conglomérat fossilifère noir appartenant au terrain crétacé, et contenant une quantité de fossils triturés, entre autres une grande nummulite." This remark is not less interesting here, where we find these little fossils in a similar deposit to that which exists at Hammar el Nafur and Ras Kariat, and which contains the same kind of fossils and nummulites; from which we might infer, if I am right in the identification of the species, that the cliff at Ras Darjah is formed of the upper part of the white limestone series, and that the loose and gritty part is identical with that in which similar Echinodermata, with nummulites, are found at Hammar el Nafur and Ras Kariat.

This group of rocks, and the sea-cliff which they present, do not extend far from Ras Darjah before they diminish in height, and become covered with a plain of yellow sand, of four or five miles in extent. The sand appears to be nothing more than a disintegrated part of the miliolitic deposit before mentioned, which here has been raised on the tops of the rocks, on which it was deposited, and, like that at Ras Abu Ashrin, has become loose on the surface, and now forms a smooth uneven tract, which, in its irregularities, correspond to those of the harder rocks beneath. It presents a sea-scarp of about 30 to 40 feet high, and ends at the little plain of Kashn; after crossing which we arrive at the mountainous tract again, which now advances to form the cape called Ras Sharwên.

This cape consists of a long narrow mountain, of a wedge-like shape, sloping towards the point, and presenting on its upper end two pinnacles; it is about two miles long, and scarped on both sides, as well as at the extremity; the latter at its lowest point is about 200 feet above the level of the sea, and the pinnacles about 1800 feet. Its longitudinal direction is about east and west, so that its inner face is opposite the main land, and it shelters a little bay inside it, which is called the Bay of Kashn. This mountain is composed of colored strata, identical with those which form the advanced part of Ras Fartak, and in like manner seems to have been denuded of the white limestone; but what has become of

the latter the land above water does not indicate; no doubt this wedge-shaped mountain was covered by it, as the next mountain to it inland presents the white limestone *in situ*. I might here content myself with referring the reader to the description of the colored strata at Ras Fartak, for those of Ras Sharwên, as I have placed the list of fossils from both places after the former, but it will be more satisfactory, perhaps, to give the observations which were made on the spot respecting their composition.

About a quarter of a mile inside the cape, where we landed, the upper part, which is not very high here, is composed of fine compact limestone, of a white or light grey color, presenting small Orbitolites, and a few remains of Echinodermata. This, after some distance down, passes into a violet, and then red colored argillaceous limestone, containing a great number of the same kind of fossils, together with bivalve and univalve shells; after which comes a yellow stratum, with blue and red bands intermixed, and then a blue deposit, almost entirely composed of small Orbitolites, like the pinkish grey limestone at Ras Fartak. The whole of these colored strata contain more or less argillaceous matter and siliceous sand. A little further in, where the red colored ferruginous strata emerge from the water, the same shattered appearance of the limestone is seen as at Ras Fartak, with calc-spar coating, and more or less filling its cavities.

Here, too, on the inner side of the cape, as on the pinkish grey limestone at Fartak, is seen a band of the miliolitic deposit adhering to the scarp 40 feet above the level of the sea, and containing in some parts, as at Fartak, large shells, and portions of the adjoining rock; while between it and the sea there is, as at other places, an interval of some yards, where it either never existed, or has been washed off by the waves.

Having finished with the inner side of Ras Sharwên, let us now go to the outer side of the cape, and here, too, a mile or two west of the latter, the red strata are again seen, but in the utmost confusion. This is owing to a mass of black scoriaceous basalt, which has forced itself up among them; and although it has not managed to reach the surface, yet, from being in the sea-cliff, a good lateral view is seen of it. It is about 300 or 400 yards long, and about 200 feet high. I had hunted in vain for a disturbing agent of this kind at Ras Fartak, and on the inner side of Ras Sharwên, but could see nothing *in situ* at either, though, from the presence of pebbles of black basalt about the base of the latter, I was led to infer that it could not be far distant.

This is the first place where we have seen an igneous rock since leaving

Marbat plain, a distance of 200 miles, and the first time we have met with black basalt on the coast; but we shall soon see that we have come to the commencement of a series of vents, which have poured forth large tracts of this igneous rock.

As we saw a raised sandy plain of the miliolitic deposit covering the low rocks east of Kashn, so we have a similar one west of Sharwên. It is coarser in structure than the miliolite of Ras Abu Ashrin, but otherwise almost identical with it. It begins close to the western side of the black basalt, which indeed it partly covers, and extends a short distance inland, and about ten miles along the sea, where it presents a cliff about 100 feet high. As before stated, it is raised, and, though smooth on the surface, takes the form of the harder and older rocks which lie beneath, while the presence of particles of basalt in it would seen to indicate that it has been formed since the eruption of that rock.

Leaving Ras Sharwên, and this tract of sand, the limestone formation continues to rise abruptly from the sea for twenty miles, when it falls back, and leaves a narrow strip of maritime plain, which is continued all the way to Ras Makalla, a distance of 140 miles, backed from one end to the other by the raised tract of limestone mentioned,—sometimes in the shape of mountains, at others in that of long portions of tableland; while extending along this narrow plain is the series of basaltic effusions to which I have alluded.

These commence immediately west of the opening of the great valley called Wadi Masilah, and about twenty miles from the beginning of the maritime plain, or forty miles from Ras Sharwên. They are three in number, and are called by the Arabs the "hariecq," or "burnt place," from a superstition that they mark the sites of seven pagan cities, which were burnt down by the Imam Ali at the commencement of the Mahomedan Æra. They form the most remarkable objects of the kind on this coast, and are continued on to a little beyond the village of Raidah, a distance of forty-five miles from their commencement. The striking features of them are their intense black color, their flatness, and horizontal extent, defined borders, and the contrast they form with the white color of the plain, and that of the limestone mountains behind them. Each tract presents one or more cones in the centre, which do not appear to be more than 200 feet above the basaltic plain immediately surrounding them.

The first cone is about four miles from Saihut, or about 50 miles west of Ras Sharwên, and the tract of basalt which surrounds it has extended nearly to Wadi Masilah on the east, and joins the following tract on the west.

The next cone is opposite the opening of the valley called Wadi Shikawi, about nine miles from the last, and about three miles inland: its tract extends westward to Raidah, a distance of about eighteen miles, and eastward joins that of the foregoing, as already mentioned. I examined a part of this tract opposite the valley of Shikawi, where it extends into the sea, and its highest part, not including the cone, did not appear to be more than 30 feet above the level of the sea. The whole of the maritime plain here is covered with large and small boulders of black and grey basalt, more or less compact, more or less scoriaceous, breaking with a rough coarse fracture, and presenting olivine in its cavities. Some pebbles which I picked up on the beach were composed of fine compact basalt, in which distinct crystals of pinkish white felspar were imbedded. All the boulders were weathered smooth, and more or less round.

The third tract begins west of Raidah, and here the maritime plain, being raised from two to three hundred feet above the level of the sea, the basalt has not only overflowed it, but found its way into the water-courses, and appears in black rocks at their openings on the beach, contrasting strongly with the whiteness of the low limestone cliffs on each side of them. There are five cones in the centre of this effusion, which are all higher I think than either of those mentioned.

Here also the maritime plain widens out to an extent of fifteen miles between the base of the high land and the sea, and, being raised, presents a cliff which at the cape called Ras Bu Gashwa is 300 feet high, but diminishes gradually on either side for a few miles, until it subsides to the level of the beach. There are several portions of this part of the plain raised in isolated mounds 700 or 800 feet high, and the whole seems to have undergone much disturbance from subterranean causes: the district is called Hammam, from the number of hot spings here. I had not an opportunity of going on shore, so I can say nothing of the sea-cliff further than that above it is red, in the middle white, and below yellow; but we shall find it again at Makalla, and perhaps may be able to infer its geological character from the composition of the cliff at that place.

I have before stated that this maritime plain ends at Ras Makalla, to which we now arrive, and on turning which we observe that it consists of a ridge of igneous rocks, supporting limestone. This ridge presents an irregular scarp of two and a half miles in extent on its western side, and on its eastern side limits the maritime plain we have just left.

When we examine it from within outwards, that is from its base to

its extremity, we find that it is made up successively of granite, limestone, and green serpentiniferous diorite.

The granite forms the base of the cape, and is a part of a group of igneous rocks which extend a little further inland. It appears here in the form of a mountain capped with limestone, the summit of which is 1300 feet above the level of the sea; that of the granite appears to be about 1000 feet. It is of a dark grey color, and uniform fine structure, and, from its amphibolitic admixture and freshness, seems more allied to syenite or diorite than old grey granite. Be this as it may, it is dyked with the green earthy diorite of the locality, and, suddenly sinking towards the cape, disappears in low peaks beneath the limestone, while the latter then forms the ridge for some distance, and is about 600 feet high. After this follows the green diorite in round topped hills, which compose the outer third of the cape, still diminishing in height, and supporting an isolated portion of the limestone between them, a little distance from the extremity. The diorite presents an earthy base of a greenish color, with crystals of dark green hornblende scattered through it; it is richly serpentiniferous, and sometimes appears like green euphotide. Where it forms a breccia with the calcareous material of the locality, an amorphous thin layer of calc-spar, with grass green serpentine, exists between the two; indeed the serpentine appears to tinge the former.

The limestone strata, which appear to be between 300 and 400 feet thick, are, in the immediate vicinity of the granite, fractured throughout, and united again by their own material, so that all appearance of continuity in their stratification has been destroyed; but in the cliff which they present in the central third of the cape, and which is about 250 feet high, they are entire, and composed as follows, viz. above of compact cellular limestone, of a pink color, presenting in one part a stratum filled with the moulds of small shells, in which there is more or less crytallized gypsum. This part also effervesces slowly with acids, and is identical, as before stated, with the same kind of limestone sent me by Lieut. Grieve from Ras Markas, near Ras Jazirah, that is as far as structure and mineralogical characters are concerned. Beneath this compact pink limestone comes a more siliceous one, filled with large cavities, which are lined with hyaline quartz and calcedony. Then follows a white stratum of more or less impure siliciferous limestone, and beneath this a dark red-colored deposit, chiefly composed of fine siliceous sand, which rests on the granite.

Though there are no separate fossils here, the upper strata abound in traces of them, and in some parts they are almost entirely composed of

small Foraminifera, allied to Nummulina. In another part of the limestone formation here, close to the granite rocks, but not in contact with them, or forming part of the ridge of the cape, small Foraminifera also abound, as at Măskat, and particularly the Operculina of that locality. I did not see any nummulites, but I think it will hereafter be found that they are not more a character of the Nummulitic Series than the abundance of small Foraminifera which exist in the limestone strata belonging to it, and indeed of which many are, with the addition of microscopic species, almost entirely composed.

Besides this limestone, we have here again the miliolitic deposit, forming in one part a bank 30 feet above the level of the sea, and in another adhering to the upper part of the scarp of the limestone cliff, extending to the cape from 60 to 100 feet above the level of the sea; while we have blocks of it on the shore on the inner side of Makalla, which have fallen down from the limestone on the top of the granite, 1300 feet above the level of the sea, slightly changed in structure, but still easily recognizable, and of a delicate color, like that of the pink or cream colored limestone in the same situation. The coarseness of the structure of these deposits at their three different heights, and the shells, pieces of coral, and parts of the old limestone rock which they contain, together with their modern appearance generally, indicate that they all belong to the same formation; but there is one difference, independent of the changes produced by heat, in the pieces which have fallen from the limestone on the top of the granite, viz. that it does not, like the other two, present portions of the green diorite. Thus it must have been raised up with the other limestone rocks before the eruption of the diorite took place, or all traces of particles of the latter must have been subsequently effaced. Still this does not interfere with the fact that this formation, which we have hitherto seen raised only 150 feet above the sea, viz. at Ras Sejăr, is here in one part 30, in another from 60 to 100, and in a third 1300 feet above its level, and in the last place so changed in color, that however young it may be considered to be, it must have preceded the eruption of the granite, and the elevation of the limestone on which it rests.

About three miles inland, north-east of Makalla, just at the outskirts of the group of igneous rocks which are continued into the formation of the cape, and among the lower hills of the great limestone tract, is a spring, from which the inhabitants of Makalla obtain their supply of water. This issues from a ravine situated among the lower limestone mountains of the table-land, which are fractured and fissured in all directions, and cemented together again by their own substance, except in some

places, where there are holes and caverns which have not been so filled up, and are more or less filled with water, both in the sides of, and leading into the interior of the mountains. The water of the spring mentioned is somewhat above the temperature of the air, but without taste or smell: in its course along the ravine it passes through sand, which has more or less accumulated on its sides, and in this sand is a quantity of botryodal magnesian limestone. The spheroids are of different sizes, up to an inch in diameter, which is the measurement of the largest obtained. They are of a coarse structure, formed of concentric layers, and present a rough arenaceous exterior. Some appear as if they had been formed in halves, from the two hemispheres not having been applied to each other in complete apposition. They are more or less adherent, and seem as if they were formed in the sand of the stream in which they were found.

Among the igneous rocks at Makalla exists a porphyry, with a dark red base, and large tabular crystals and nodules, of greenish felspar; also epidote with calc-spar, as at Masira. Mica prevails in some parts, and various other earthy minerals, which are generally found in company with such rocks.

Leaving Makalla, and proceeding south-westwards along the coast for about six miles, we meet with no sea-cliff whatever, but a sandy shore, with scattered hills interiorly, and then sub-ranges of mountains; behind which, and towering above all, is the brink of the table-land, here about 6000 feet above the level of the sea.

At Ras Brum, however, which is at the termination of this sandy shore, and which is opposite Ras Makalla, as the coast runs, igneous rocks again make their appearance, and from thence are continued on to Ras el 'Assidah, a distance of about fifty miles, after which they subside gradually in dark peaks, scattered here and there among the sand-hills of the coast.

This tract of igneous rocks fringes the shore for the distance mentioned, and is continued inland for two or three successive ranges, mixed more or less with limestone, to the base of the table-land, here fifteen miles from the sea. From their brown color and peaked appearance they closely resemble the granite of Makalla; and about Ras Brum, before stated to be opposite Ras Makalla, is the same kind of green-colored rock as that forming the outer third of the latter cape, viz. green diorite: at Ras Brum also it is in round-topped low hills like those of Ras Makalla, and separates the brown peaked mountains behind, which are 1000 feet high from the sea. In all probability these rocks are but a repetition of those forming Ras Makalla, but at Makalla my actual exami-

nations cease, and I can only now state that which I have seen of this part of the coast while sailing leisurely up and down it two or three times, and from the sketches I then made of it.

I have observed that these rocks are more or less mixed up with limestone,—the limestone no doubt through which they have been forced,—so that here and there white ridges appear among the dark brown rocks, and occasionally come to the sea, as at Ras Rättle, which is a conspicuous white mass of limestone five miles east of Ras el' Assidah. The islands, too, off Hisn Ghorab, a little east of Ras Rättle, viz. Hällani, Jibus, and Baragah, are all of white limestone. Jibus, which is perhaps the largest, is five miles off shore, hardly a mile long, and about 300 feet high.

A little west of Ras Brum there is a long low level piece of pink or red-colored strata, bordering on the sea, and presenting a cliff similar to that of the raised part of the maritime plain at Ras Bu Gashwa; it is probably an undisturbed part of the same formation.

The dark mound on shore, called Hisn Ghorab, famous for bearing the longest Hamyaritic inscription that has been met with, is stated (Wellsted's Trav. in Arab. vol. ii. p. 423) to be composed of a dark greyish compact limestone, 500 feet high; and in further proof of the general elevation of this coast, which from what I have stated must now, however, be pretty apparent, it is also mentioned that "The action of the sea might be plainly seen [at the foot of this mound] in the cavities and hollows exhibited by a ridge of rocks now some distance from the water, but which evidently at some not very remote period must have been covered by it."

Between Ras el 'Assidah and Aden, the coast is almost wholly unknown to me, except from a distance; there is no sea-cliff there, and not much on the maritime plain to interrupt the view from the sea to the base of the mountains after leaving the neighbourhood of Ras el 'Assidah. About sixty miles north-east of Aden the high land advances to within a few hundred yards of the shore, and affords a grand view from its rapid and almost uninterrupted descent from three, four, and six thousand feet to the plain below. The sea, too, just here, is vastly deep, and admits of close approach to the shore without danger.

Not more than twenty-five miles on from this, the seaward boundary of the mountains recedes from the direction of the coast, and stretching over to the Straits of Bäb el Mandeb, ends in the south-western extremity of the great elevated tract of Southern Arabia, while the coast, continuing on in its original course some miles further, before it takes a similar turn, leaves a triangular plain, at the apex of which is

the town of Aden, situated in the crater of an extinguished volcano, the sides of which reach about 1700 feet above the level of the sea. This crater opens towards the east, and presents a tail of peaks, ridges, and low cones, in the opposite direction, the whole of which amount to about six miles in extent.

I had not an opportunity of examining much of this mass of volcanic rocks, but I could see that they were principally composed of basalt, pierced with dykes of the same material, in a more compact state. The external side of the crater is more or less scarped, and separated from the high peaks and ridges which flow from it, and in this scarped portion may be seen lines of horizontal stratification: also some distance up the side of the slope which descends towards Back Bay may be seen a a small series of strata, consisting of pisolitic peperino, cemented together with glassy crystallized gypsum, and from the manner in which the pieces of pumice, basalt, and obsidian of which it is composed are arranged, together with the fact of the cement being sulphate of lime, leaves no doubt that it was deposited in the sea, and afterwards raised to its present position; at one part it is at least 200 feet above the level of the sea, though it descends to the water's edge in another. The stratification of the walls of the crater, which is very high up, would also lead us to the conclusion that the greater part of this igneous mass has been poured out under the sea, and has been gradually raised to its present height.

Through the kindness of Dr. Malcolmson, whose name I have already had occasion to mention, and who resided at Aden for some time, I am in possession of specimens of all the rocks and minerals which this gentleman after a long search was enabled to collect; and, having been permitted to inspect his valuable assortment when at Aden, I am enabled to state that the igneous rocks of this peninsula consist of basalt in almost all its forms, compact, black, grey, peridotic; rough, cellular, scoriaceous, variolitic; tephrine, with small crystals of glassy felspar, which forms some of the high peaks in the interior of the crater; leucostine, which forms part of the lavigenous effusions in the north-west part of the peninsula, where the last vents of the volcano appear to have existed; pumite and stigmite, simple, variolitic, and pisolitic, which form small deposits in various parts of the general mass, and semiopal and calcedonies, which abound in the island of Sira, opposite the opening of the crater.* To these may be added brown carbonate of lime, in columnar stratified crystalline deposits, with transverse wavy lines;

* For the characters of the rocks here mentioned see Brongniart's classification, Art. "Roches," Dict. des Scien. Natur.

massive and fibrous gypsum; and fluor spar, in minute crystals of an amethystine color, on the surface of calcedonies.

The recent littoral deposit here, as elsewhere on this coast, appears in several parts of the north-west part of the peninsula, raised fifteen or more feet above the level of the sea.

About four miles west of Aden there is another group of volcanic rocks, said to be partly composed of granite, and their peaked forms would indicate this; it is about the same size as Aden. Last of all on this coast comes the small dark group, probably also of igneous origin, which forms the eastern promontory of the Straits of Bāb el Mandeb.

Having thus come to the termination of the South-east Coast of Arabia, let us now pass over to the African Coast; and, commencing from Berbera, which bears nearly due south of Aden, see if the rocks extending from this part eastward to Socotra have any resemblance to those on the coast we have just left.

Personally I know nothing of this coast, but Lieutenant Grieve, who surveyed a good part of it between Berbera and Guardafui, kindly collected specimens for me from the principal headlands between Berbera and Ras Sārai, and from all the islands excepting Socotra.

From these, and the observations which accompanied them, it appears that the top of the bluff at Syara, which is 300 feet high, and about eighteen miles east of Berbera, is composed of a coarse heavy sub-saccharoid magnesian limestone, effervescing very feebly with acids, and of a reddish color, and ferruginous aspect; while the base is composed of the same kind of rock, but of a greyish brown color: both are without any appearance of fossils.

The top of a hill on the coast seven miles further on is composed of a fine compact limestone, of a yellowish white color, breaking with a smooth conchoidal fracture.

That of Hamarah bluff, which is 500 feet high, and twelve miles further on, of a fine compact sub-cellular limestone, of a cream color, mottled with spots of red and white, with frosted cavities of calc-spar; also effervescing slowly with acids.

The top of Ras Khanzir, about 200 feet high, and seven miles further, of a fine compact limestone, of a yellowish color, like that of the hill on the coast seven miles from Syara. Some portions appear, from their veined structure, and opaque appearance, to have been exposed to volcanic influence. There is another portion from this cape, too, which, from its open structure and fossiliferous composition, is evidently of a later formation, and resembles much the modern deposit at Makalla. It has in like manner been exposed to heat, and its cavities and

fossils are more or less soldered together by an amorphous white crytallization of carbonate of lime.

The next specimen is from the hills near Ras Shalla, fifty miles further on. This is a compact limestone, of a pinkish color, and uniform structure, breaking with an even granular fracture.

Hais Bluff, 500 feet high, and fifteen miles further on, affords a compact heavy limestone, of a granular sparkling structure, and a greyish brown color. It is highly magnesian, scarcely effervesces with acids, and closely resembles that of the base of the white limestone cliff on the east side of the Fartak range. Hais Island, close to this bluff, is 300 feet high, and composed of a sparkling, black green amphibolite, fissile, laminated, and very much resembling gneiss, but serpentiniferous at the joints, and closely allied to the sparkling hornblende rock of Ras Jazirăh, on the South-east Coast of Arabia.

Meyt or Burnt Island, about twenty-six miles further on, and seven miles off shore, yields a pegmatite in composition, but not graphic in structure, and a compact limestone of a fine uniform saccharoid structure, and grey color, effervescing feebly with acids. This yields by a rough analysis 15.32 per cent. of magnesia, and its specific gravity is 2.775 : it is a dolomite.

In the Museum of the Bombay Asiatic Society are specimens of limestone from Mărriyah, two hundred miles further east, and forty-five miles west of Guardafui. They were presented by Lieut. Cruttenden, of the Indian Navy, and are of a cream color, and compact fine structure, identical with the limestone on the top of the granite peaks at Makalla.

From this place we pass on to the islands between Cape Guardafui and Socotra, the first of which is Abd el Kuri, from which Lieut. Grieve sent me specimens, as well as from the islands called Kal Farun, and "The Brothers," situated between it and Socotra.

The summit of Abd ul Kuri is 1600 feet high, and composed of a fine white compact limestone, breaking with a smooth conchoidal fracture, dry, and opaque, as if it had been exposed to heat; and the lower hills, which are from 200 to 400 feet high, yield grey and red granite; fine and coarse-grained diorite, composed of black hornblende and whitish semi-transparent felspar, ophiolitic diorite, and euphotide; indeed all the kinds of igneous rocks that we have seen on the Arabian coast north of Marbat.

There is also a coarse, compact, sub-cellular, and sub-saccharoid limestone, of a light cream color, which comes from the higher parts of this island; it probably overlies the igneous rocks, and owes its color to the

action of heat; otherwise in structure it is just like the upper stratum of the low cliff in the Bay of El Kammar, and the dark brown limestone of the shores of Dofar.

The island of Kal Farun, fifteen miles north of Abd el Kuri, seems to be entirely composed of sulphate of lime. One specimen, coming from a height of 400 feet, is massive, compact, sub-saccharoid, and of a brown color; the other, which comes from high-water-mark, is earthy, white, and contains moulds of small shells, with particles of igneous rocks.

Turning to "The Brothers," which lie between Abd el Kuri and Socotra, we find the largest, or westernmost of these two islands, to present pink granite rocks, 1000 feet high, with limestone above them, reaching in all to 1600 feet; also diorite, as at Abd el Kuri; and a white compact limestone conglomerate, raised 300 feet high. The latter consists of small rounded gravel, shells, and corals, which have been firmly cemented together, and more or less opalized, probably by heat; while the same kind of conglomerate, with a few particles of igneous rocks, exists at high-water-mark in the easternmost island, still possessing its original loose, dull, and recently-formed appearance.

Of Socotra I know nothing more than can be gleaned from the late Captain Wellsted's account of this island, (Jour. Roy. Geograph. Soc. vol. v. 1835.) In the vicinity of Tamarinda, a town situated towards the centre of the northern coast of the island, there are granite mountains, 5000 feet high by measurement. "Connected with the granite range, and extending form north to south, a lower range is found, averaging in height about 1900 feet, and composed of a compact cream-colored primitive [?] limestone. From this the hills diverge in short ranges to the sea-shore, their outline being mostly smooth, with table summits and rounded sides, except those nearest the sea, which mostly present a steep wall. The whole of the hills in the western part of the island are similar in their appearance, elevation, and construction."

In the neighbourhood of Goobet Koorma the limestone appeared to be borne up upon the granite, and the line of junction between the two was seen 3000 feet above the place where Captain Wellsted stood.

Syenite, porphyry, and trap, were seen in different parts of the island, and the soil of the mountains is clayey, stiff, and of a red color.

Returning to the Somali coast, it is stated, that after a short but variable distance in-shore, the land from Berbera to Cape Guardafui is raised to a height averaging between four and seven thousand feet, and attaining its maximum elevation midway between these two places. It is composed of limestone, and the specimens I have seen from it have been more or

less fine and compact in structure, and of grey and white colors, similar in every respect to the limestone of the elevated tract on the South-east Coast of Arabia; while the cream-colored limestone in like manner seems to come from the tops of the lower hills, where it is probably in closer proximity with the igneous rocks.

Thus we see that the same kind of igneous rocks, and the same kind of limestones, exist on this part of the coast of Africa and its adjoining islands, as are found on the South-eastern Coast of Arabia and its adjoining islands; the same kinds of magnesian limestone, and a modern formation, corresponding to our miliolitic deposit.

There is also a spheroidal concretion of magnesian limestone, about the size of a walnut, which Lieutenant Grieve sent me from the coast of Africa, similar in every respect to that which has already been described as existing in the course of the hot spring near Makalla.

This concludes all that I have to offer on the geology of the North-east Coast of Arabia without the Persian Gulf, the South-east Coast and its adjoining islands, and the Somali or North-eastern Coast of Africa and its adjoining islands. Let us now briefly review what has been stated respecting the South-east Coast of Arabia.

The first thing that strikes us here is the continuity of the white limestone formation, which we may reasonably infer to be the same from one end to the other, a distance of 1125 miles; secondly, the eruption of igneous rocks along the great line of fracture, or fault, which forms the coast; and, lastly, the elevation of the land from four to six thousand feet above the level of the sea, which has brought into view other formations, lying beneath the white limestone.

Turning our attention first to the igneous rocks, we find that they comprise all the principal kinds, and probably most of the varieties, included under this denomination; and that by far the greater part of them are hypogene, (Lyell,) the rest volcanic. The presence of gneissic strata in the granite at Marbat also shows that some of this rock is at least secondary; and being mixed up with limestone in the same neighbourhood, identical but for the changes which such formations undergo when similarly situated, with some of the white limestone series above, further shows that there is granite here, which may be of still later date even than that enveloping the gneiss. The gneiss itself *in situ* I did not see.

We have also witnessed the dioritic and euphotide rocks, which prevail on the north-eastern third of the coast, enveloping jaspideous strata at Masira and Ras Jibsh; at the same time we have seen nummulitic strata resting on them at Mäskat and Masira, but in no instance have

we observed either the granite or the dioritic rocks overlying the white limestone series; while on the south-western third of the coast we have seen a chain of volcanic vents up to Aden, inclusive, pierced through everything, and an issue of black basalt and other volcanic rocks from them, which have overflowed the maritime plain in different places to a great extent. What the nature of the igneous rock may be at Ras Shuamiyah I know not, having only seen it from the sea.

Lastly, we have observed that the original localities of eruption of igneous rocks on this coast appear to have been the principal ones of the subsequent eruptions, with the exception of the volcanic rocks, which have come to the earth's surface, where the older igneous rocks do not appear.

Let us now go to the aqueous formations, and these we may separate into three *Groups*, viz., 1st, the strata of which the highest scarps are composed; 2nd, those of the compact littoral deposit on the shores of Dofar; and, 3rd, the loose, or miliolitic deposit.

1*st Group*.—This admits of three divisions.

The first or uppermost includes the white limestone series, which extends from the summit of the table-land to the commencement of the colored argillaceous strata. This consists, from above downwards, of compact white limestone, more or less composed of the remains of minute and small Foraminifera, with here and there concretionary flints, ex. gr. Măskat, Masira, Hammar el Nafur, Ras Kariat, and Ras Shaherbataht; and that the flints also occur in the summit of the table-land above Marbat may be inferred from their presence in the talus beneath, separate, or combined with pieces of the limestone in which they were imbedded; also generally throughout this coast, from their presence at Resut, the beach in the Bay of El Kammar, and the cliff at Ras Darjah. Below, this passes into a soft white limestone, and then into a gritty loose chalky or sandy deposit, becoming more or less argillaceous towards its lower part, at Măskat, Masira, Hammar el Nafur, and Ras Kariat, where it presents nummulites; also at Ras Shaherbataht, Jibal Jinjări, Marbat, and Ras Hammar, (the argillaceous pipe-strata,) and Ras Sejăr, (the *khat* or chalk on the summit of the cape,) where the existence of nummulites has not been determined. Then follows a deposit of clay of a greenish white color, at Hammar el Nafur and Ras Kariat; also at Masira, where it is colored dark green and red, while at Măskat it is replaced by a siliceous sandy conglomerate. (Măskat is included here for the sake of comparison.)

Here, then, we have a distinct, though little series, passing from pure calcareous material above to pure clay below, with siliceous matter between; and in this series we have at Măskat, Masira, Hammar el

Nafur, and Ras Kariat, the presence of nummulites; while the existence of the so-called chalky stratum and flints in the more elevated and inaccessible parts of this coast would lead us to infer that the same little series existed there also, though as yet it has not been explored for nummulites. The presence also of nummulites (?) and orbitoides in the cliff at Takah, which is but an unraised portion of the great limestone formation, further favors the inference; and with this evidence of the existence of this little series on the high land of Southern Arabia we must be content until further observation can prove it more satisfactorily.

The presence of the clay here, too, not only serves to mark a subdivision in the white limestone series, but also seems to point out the time in its formation when the dioritic and euphotide rocks were erupted, as well as the origin of the clay itself; for from the strata in which the nummulites are imbedded having been deposited after the eruption of these rocks, as seen at Mäskat and Masira, and also after the deposit of the clay, as seen in the white limestone series at Hammar el Nafur and Ras Kariat, taken in connection with the change in the nature of the sediment in the latter, just preceding the appearance of the nummulites, it is plain that an eruption did take place about this time, affording the material of which the clay is composed, for had this not been the case the formation of the white limestone strata would have gone on uninterruptedly to the pure deposit above the nummulites. Hence we also see that this may actually be the case in places to which the material composing the clay might not have extended, and there the nummulites alone, or their allied fossils, must mark the upper division of the white limestone series. That this eruption was that of the dioritic and euphotide rocks may also be reasonably inferred from the nummulites overlying the latter, as well as the clay of the white limestone strata; and from their having been deposited in both places, just about the time the disturbance had become quieted, the remains of marine animals had begun to accumulate, and the siliceous material was beginning to disappear. The depth of this little series, overlying both the limestone strata and the igneous rocks, also seems to correspond, and this led to my remarking in my observations on the igneous rocks of Mäskat, (loc. cit. p. 126,) that the Nummulitic Series appeared much thinner at Mäskat than in many parts of the South-east Coast of Arabia. Let us now see whether there is anything to make us think that this is a fact, and that the great mass of white limestone strata, upwards of 1500 feet thick, which underlies the clay there, is but a continuation of the Nummulitic Series.

I have stated, p. 42, that impressions of Orbitolites exist in the marl

which passes into this clay at Hammar el Nafur and Ras Kariat; also that a spheroidal Alveolina in company with large Orbitolites and an Operculina abounds in the white limestone series at Marbat, and that this is exactly the case in a part of the Nummulitic Series (?) in the Hala range of mountains, near the Buran River, in Lower Sindh. Lieutenant Grieve also sent me specimens of white limestone from the summit of the table-land at Marbat, which contain numbers of Alveolina. Now the presence in this marl of Orbitolites which we have seen to increase, and that of the specimens of Alveolina with Foraminiferous tests generally which we have seen to decrease in number as we descend the white limestone series, seems to point out, that where these fossils commence to appear and the latter is most numerous, is the passage from the nummulitiferous strata into the inferior sub-division of the white limestone series, or orbitolitiferous strata; more properly termed perhaps alveolitiferous strata, for, plentiful as we have seen specimens of Alveolina in the white limestone strata at Marbat, they are probably much more plentiful in it in other parts of the coast, since they are so abundant in a part of the Nummulitic Series in Lower Sindh that there whole strata almost are made up of them, while in Arabia we have also seen them exist from the summit of the table-land (at Marbat) to the base of the white limestone cliff (at Fartak), though probably largest and most abundant between the two; at the same time we have observed the Orbitolites to reach their maximum density in the colored argillaceous series, which therefore more particularly deserves the term of orbitolitiferous strata. But, call these strata what we will, the point in question here is whether or not the whole of the white limestone belongs to the Nummulitic Series, and this must be left for future exploration to determine: all that can be deduced from the previous observations is, that the same kinds of fossils are to be found together in the talus of the great limestone scarp at Marbat as are found in the nummulitic limestone of Lower Sindh, and that the presence of Orbitolites with them seems to point out that they come from strata below the green clay, and therefore from the lower division of the white limestone series. I regret that I cannot state more of this sub-division than that the strata of which it is composed chiefly consist of fine white compact limestone, breaking with a smooth conchoidal fracture, more or less lithographic in structure, and of different shades of white and grey colors; it is generally scarped and inaccessible. At Fartak, we have seen that the lowermost of these strata are more or less magnesian, and in some parts dolomitic; but this, which we have frequently observed in this series on other parts of the coast, seems to be owing to local causes.

We now arrive at the second division of the *Group*, which comprises the colored argillaceous series, and this we have estimated at 300 feet at Marbat, 175 feet at Ras Sejăr, and 1000—1200 feet at Ras Fartak.* We have also observed it to consist of red, blue, green, and yellow argillaceous strata, sandy shales, and impure limestones, in which a red color is most predominant; and to contain, in addition to Orbitolites, throughout, but most numerous in the lower part, species of Echinodermata, Isocardium, Pecten, Exogyra, Ostrea and Ammonites, probably all of the cretaceous age: hence, if we consider the whole of the foregoing division as belonging to the Nummulitic Series, or Lower Eocene, this division must here be considered as the upper member of the Cretaceous period.

The third and last division of this group is the micaceous sandstone, of which we have seen so little that all that can be stated is that it is of great thickness, and, though laminated in some places, is for the most part massive throughout. As before observed, it fines upwards as it passes into the argillaceous division, and becomes coarser towards the bottom, where the gritty particles of which it is chiefly composed are evident to the naked eye. At Marbat it is mostly of a ferruginous yellow ochreous color, and at Ras Sejăr its upper part, which is the only portion of it exposed, is of a light greenish blue color, and veined with white quartz.

2nd Group.

We now come to the *2nd Group*, which we have seen best developed between Marbat and Resut. It consists of two kinds of limestone, both of which are more or less coarse and compact; the upper one is also more or less impure, shelly, and of a reddish white color, and the under one of a dark brown color, containing here and there pebbles of the older limestone formation, and particles of igneous rocks. Both together do not occupy a thickness of more than 50 feet at the utmost, and no part of this little group that I saw is raised more than 100 feet above the level of the sea. It rests on the compact limestone of the Nummulitic Series, and is chiefly characterized by the dark brown color of the lower stratum, and its extreme cragginess where exposed to the action of the waves.

We must be content with the mineralogical characters alone of this *Group* for its separation from the others, since the few fossils obtained

* Almost all the heights and thicknesses given, with the exception of those stated to have been computed by trigonometrical measurement, have been assumed, or obtained in a rough way, for as these observations formed no part of the survey, the means of making them accurately were of course very limited.

from it are too imperfect to be of any service in this respect. From the *1st Group* it is easily distinguished by its superposition, and the presence of pebbles of the older limestone; and from the *3rd Group* it is distinguished by its compactness, and the thoroughly fossilized state of its organic remains, together with its inferior position. My impression is that it belongs to the Older Pliocene age.

3rd Group.

Lastly comes the *3rd Group*, or miliolitic deposit, which is chiefly characterized by its loose structure. In its purest state, as at Ras Abu Ashrin, that is where it is not mixed with coarse littoral debris of shells, or aqueous or igneous rocks, we have seen it to be composed of minute grains of calcareous matter, with which is mixed a small quantity of hyaline quartz; the former being nothing more than the tests of microscopic Foraminifera, loosely cemented together by a partial dissolution and re-crystallization of the external parts of their shells. The purity and whiteness of this deposit is of course in proportion to the distance it has been formed from the shore, or the neighbourhood of coarse loose material; hence, in addition to the locality mentioned, it is very pure in the plain of Dofar, on the western side of Ras Sejăr, and in the sandy plains on each side the port of Kashn, while in most other parts we have seen it mixed with large shells, pieces of coral, and rocks of the neighbourhood. Perhaps 100 feet is about its average thickness. It exists at various degrees of elevation, from 15 to 150 feet high, throughout the coast, and the fact of its having been raised up at one place, viz. on Jibal Ghara, at Makalla, to the height of 1300 feet, seems to point out that it does not belong to the *Recent* deposits, though probably to the Post Pliocene formations. At Resut it is found filling the lithodomous excavations in the coarse shelly limestone of the *2nd Group*, and there also it contains oyster shells of the same species as those of a recent bed close by. At Marbat, where it fills the fissures of the granite plain, it contains a number of shells and corals, many of which are very large, Hippopus, Ostrea, &c. One species of the latter is perhaps the largest known: it exceeds in size *Ostrea latissima*, (Desh.) We have also seen that it is not only met with throughout this coast, but that it extends to the peninsula of Kattyawar, in India, from whence it is imported at Bombay for building stone; and from forming the lower part of the Desert of Akhāf, opposite Masira, it may perhaps be continued into the heart of Arabia. It is also this deposit which, from its modern appearance, and elevation above the sea at different places, forces upon our attention the gradual elevation of the whole coast; not less so, however, than the *recent* deposit itself, which, though less

striking, may be seen in many parts above high-water-mark; but these limited elevations sink into insignificance when considered with the extent of elevation and depression which the cracked sandstone at Marbat proves this coast to have already undergone.

From the foregoing data, then, and in the absence of more extended and precise information, we obtain the following table of the aqueous strata on the South-east Coast of Arabia:—

POST-PLIOCENE ? *Miliolitic Deposit*, 100 feet ?	Loose granular deposit of white calcareous particles, chiefly consisting of the remains of microscopic Foraminifera; with which is mixed a variable quantity of colored siliceous particles of igneous rocks, and, in some places, shells, corals, and rounded pebbles of the neighbouring formations, far exceeding in proportion the finer material; shells and corals more or less loosely imbedded in the latter, and retaining, for the most part, their original whiteness and structure.
OLDER PLIOCENE ? 50 feet ?	Coarse, compact, whitish limestone, more or less mixed with red argillaceous earth, containing shells and corals, resting on a brown compact limestone, imbedding pebbles of the older calcareous formations, and rounded gravel of igneous rocks in the locality; shells and corals more or less consolidated with the rock, and for the most part deprived of their original whiteness and structure.
LOWER EOCENE ? 2000 feet ?	*Upper Division.*—Consisting of fine compact white limestone, with concretionary flints, the former more or less composed of the remains of small and microscopic Foraminifera; a soft calcareous limestone or grit, with Nummulites; and a stratum of greenish white marl and clay, with impressions of Orbitolites. *Lower Division.*—Fine compact limestone strata, more or less lithographic in structure, of different shades of grey and white, containing large Orbitolites and Foraminifera of the genus Alveolina, together with fossils of the Nummulitic Series.
CRETACEOUS PERIOD. 1000 feet ?	Argillaceous strata, composed of impure limestones, clays, and shales, of different colors, principally red, richly charged with small Orbitolites, and containing Echinodermata of the genera Discoidea, Pygaster, Diadema, and Salenia; Pecten,* Ostrea, *Exogyra flabellata*, *&c.* and Ammonites.
1700 feet ?	Compact micaceous sandstone.

* For "*Pecten quinquecostatus*, Sow. mihi," p. 74, read "Pecten.—1st *Species*?" and, in the same paragraph, for "three broader ones" read "two broader ones."

Such is a faint outline of the Geology of the South-east Coast of Arabia; the few fossils collected from whence will, I trust, sooner or later reach the Geological Society of London, where they will meet with that attention which they deserve. I have given some of their characters here for local reference, but we must look for more useful and authentic descriptions of them from a higher source.

ART. IV.—*Observations on three Copperplate Charters, granted respectively* A. D. 933, A. D. 1261, *and* A. D. 1391, *with Facsimiles, Transcripts, and Translations.* By MAJOR GEORGE LEGRAND JACOB.

Communicated by Government.

No. 1, *of* A. D. 933.—This records the grant, in the Sháliváhan year 855, by a Sovereign of the Yadu race, Govindráj, of the village Lohagrám, in the district of Rámpur,* to Keshava Dikshit, son of a Bráhman fellow-student. The language is pure Sanskrit, but inflated with gigantic hyperbole, puerile conceits, and far-fetched metaphors, containing little matter to compensate the labor of digging out the meaning.

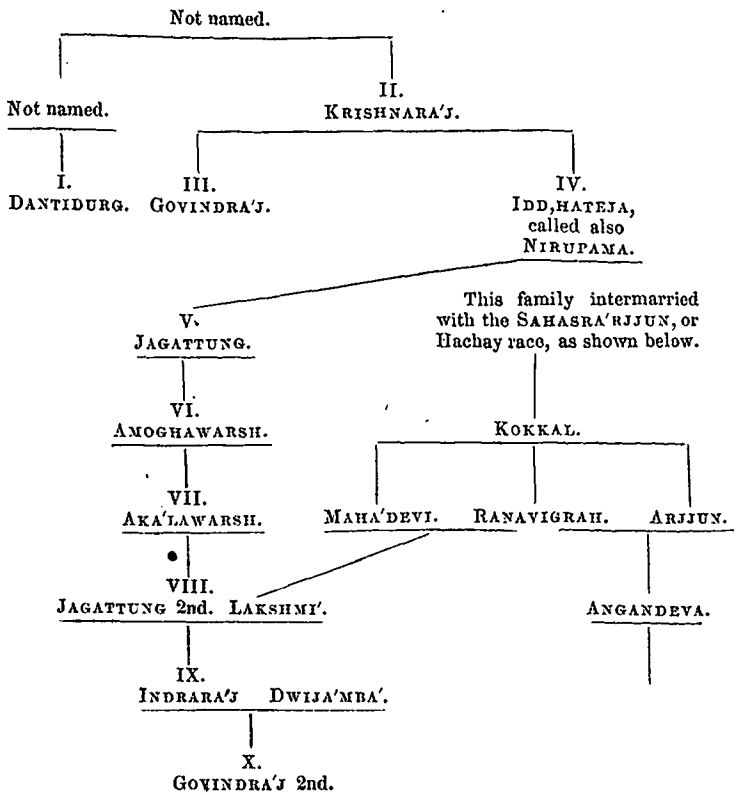
The plates belong to a Bráhman family, residing near Sánglí, but to what quarter the grant may pertain I know not. The seven places recorded may help to fix this: 1st, Lohagrám, the village given away; 2nd, Rámpur, the "Táluká," the four villages bounding the grant, viz:—

Ghodégrám,
Vajulí,
Vinchaviharabh,
Sonnahí,

and lastly, Púndawarddhan, the birth-place of the grantee. From a passage alluding to the Ganges and Jamná as "watering his kingdom," the Yadu sovereignty at this era must have been more extensive than is generally supposed.

The following genealogical tree is gathered from the plates, and it will serve to clear up doubts left by previous inscriptions. It differs little from Bál Gángádhar Shástrí's attempt to reconcile his and Mr. Wathen's notices published in the Transactions of the Bombay Branch Rl. As. Society, No. V. April 1843, page 213. The Roman figures give the order of succession:—

* Called Rámpúri Sapta shat, or Rámpur of the seven hundred (villages probably).



Donor of the grant is called also Suwarnawarsh, and Wallab,h Narendra Deva.

The senior name of the race, second in succession to the Gadí, is described as having overthrown the Chalukyas, the reigning tribe celebrated in the Nerur plates.* Supposing the ten reigns to average fifteen years, which, as the fourth Ráj was a first cousin to the first, will be nearer the mark than the higher average generally assumed, this would give the year A. D. 783 as the period of the overthrow of the Chalukyá dynasty by the Yadu.

No. 2, *of* A. D. 1261.—This inscription shows the Chalukyas again in the ascendant, and reigning at "Kalyán," Kanudeva the King.† His Minister, Keshava Mahájaní, bestows the village Tereovatak, the modern Terwan, in the Rajapur taluka, on certain Bráhmans and

* See Vol. VI. of the Society's Journal, pp. 203, *seq.*

† Boasting also four other high-sounding names.

the deity Vimaleshwar, the latter said still to enjoy his portion. The Sanskrit is not grammatical; the character approaches much nearer to the modern type : the inscription is probably the same of which an imperfect copy and translation are given in Vol. V. Rl. As. Soc. Journal, page 177.

No. 3, *of* A. D. 1391 is an interesting relic of the Bíjánagar dynasty, founded, according to Ferishta, in A. D. 1344, by Bilál Deu, Raja of the Carnatic, who named it after his son Bíjá.* I regret not having Wilks to refer to. Hamilton, quoting him and other authorities, dates the commencement of this city A. D. 1336, and completion A. D. 1343, by "Aka Huryhur and Burra Huryhur, and their Minister the learned Mádhava Acharya." This inscription gives only the following genealogy :—

ACH YU'T, married to Shrí.

BUKKARA'J.

HARIHAR.

The first named is not spoken of as a sovereign, but the second is. The discrepancy between all three—Ferishta, Hamilton, and the plates —remains to be cleared up, but there would evidently seem an error in attributing the foundation of Vijaya to the parties named; for, supposing another and previous Harihar, there would scarcely have been another and powerful Mádhawa : this person is celebrated in Sanskrit writings as the Minister of the Bukkáná race, which, supposing him to retain office under the son, agrees with this genealogy. His different names, according to the Shástrí, who is my authority on this point, are Mádhava Acharya, and Chatur Vedáchárya. Later in life he forsook mundane affairs, turned Sunyásí, and received the name of Vidyáranya.† This inscription, alluding to Vijaya, says that Bukkaráj here lived as an Indra, defying all his enemies; and as no mention is made of Achyut's deeds or residence, the inference is that Bukkaráj was the first of the race who established himself in power in this quarter. Harihar is described as ruling over the whole of the Indian peninsula that is washed by the ocean, and it seems doubtful whether supremacy to the Indus be not claimed. His Prime Minister, the aforesaid Mádhava, whom he invested with the sovereignty of Jayantipúr,

* Properly Vijayanagar, the City of Victory, called in this inscription Wijayá only.

† His works are said to be, Adhikarana Vijayá-Mala, Kála Madhawa, Paráshara Mádhava, and several others much prized.

conquered Goa from the Turushkas (Turks), and re-established there the worship of the ancient idols, which they had uprooted. This victorious personage, before transferring control over the Goa country to another Minister, named Narahari, granted to the parties named in the plates the village of Kuchchar, called also Mádhavapur: this village, the modern Kochré, is not many miles from the present Goa frontier, Sawánt Wadí.

G. LEG. JACOB,
Political Superintendent, Sáwant Wádí.

16*th November* 1849.

No. I.

PLATE DATED SHA'LIWAHANA SHAK 855, A. D. 933.

Free Translation, but as close to the Sanskrit as the language will admit of.

The melodious Sámved songs, in which Saraswatí* takes delight, sung by Brahmá, pleased with the creation of the universe, continue in honor. From the moon, that swan sitting on the lotus of the cerulean lake, surrounded by a numerous train of star-like lotuses—that silvery parasol of the great king Kám,† whose unrivalled sway prevails throughout the creation—that milky ocean in beauty—that silvery mountain in resplendence—that ivory comb of the Goddess‡ who rules over the Eastern quarter—that mansion of universal beauty, there sprung a race whence issued forth on earth an ocean-like branch of Yadus, the abode of riches and fame, the theatre of policy, prosperity, and deep meditation, beneficent, and renowned for protecting the poor. In this cloudless heaven rose Dantidurg, skilled in arts,‖ to whom his host of enemies were submissive as the starry spheres to the moon, the abundant and extensive rays of whose fame, like those of the moon's white light, filled all quarters.§ His illustrious son-like paternal uncle, Krishna Ráj, having ascended the heroes' ancient, Meru's crest-like throne, dispelled the dark and insolent Chalukya race, and sent forth as the sun does when first rising over the mountain tops, the light of his power over other kings,¶ and diffused his glory throughout the world. His son, Govindráj, born at Indubimbashilátal, orna-

* The Indian muse. † The Hindú Cupid. ‡ Untranslatable.

‖ Here is an untranslatable play upon words, founded on the double meaning of the adjective *kalawana*, "possessed of digits," and "possessed of arts," the former applicable to the moon and the latter to the king.

§ Also "gratified the hearts of mankind."

¶ The play upon the word अत्त *atta*, signifying both "light" and "command," admits of no exact translation in English.

mented by a mark caused by the smoke of his burning enemies, came after him. He was succeeded by his illustrious younger brother, Idd,hateja, also called Nirupam, who had a heroic and philanthropic heart, and whose dread made the progeny of his numerous enemies to tremble, and whose sway-tracing signet (Mudra) reached to the seas, hence known by the name of Samudra (with signet), which they still bear.* He was followed by his son Jagattung, whose rivals, bereft of their authority, had become as sapless and impotent as the withered breasts of old women. His son Amoghawarsh, who succeeded him, was of incomparable power.† His spotless fame so wide, that, filling up the whole universe, and finding no outlet, it ultimately overflowed in the form of water into the deep ocean of the world. Of him was born king Akálawarsh, to whom experienced shieldsmen, terrified by his prowess, instantly surrendered, throwing down their swords and bucklers. Mahádeví, an ornament of the Sahasrárjjun race,‡ the daughter of Kokkal, became his queen. Their son, king Jagattung, resembling Dharm (Ajatashatru) by having no enemies, but glorious for prowess, like Bhímasen and Arjjun,‖ was married to Lakshmí,§ the daughter of Kokkal's son Ranuvigraha, who was able to withstand his rival kings, deep, and holding, like the ocean, precious things. From the king Jagattung arose Lakshmí's son,¶ like the sun from the Udayachal,** glorious, flourishing, called another sun amongst the kings, and who truly deserved in this world the name of Indraráj,†† being one entitled to continual homage,‡‡ exterminating all iniquitous kings and their adherents by the thunderbolt of his prowess.‖‖ Dwijámbá (who like

* Here is a play on the word *Samudra*, signifying "seas" in one sense, and "with signet (or power)" in the other.

† A few words following are unintelligible.

‡ Afterwards also called Hachayá.

‖ Dharm, Bhímasen, and Arjjun, are the first three of the brothers called the "five Pándavas."

§ The metaphor is constructed by comparing this princess to Lakshmí, the wife of Vishnu, the goddess of wealth, and also the first of the fourteen precious things produced by the ocean, when it was churned by the gods and giants.

¶ The play upon the words *Lakshmyáh nandanah* signifies as above given in one sense, and "supporter of splendour" in the other.

** The name of the mountain behind which the heavenly bodies are supposed to rise.

†† The metaphor is constructed by comparing this king with Indra, the chief deity (quite a Jupiter Tonans), supposed to have punished the flying mountains by scorching up their wings with his thunderbolts.

‡‡ The play upon the term *Animisha-darshana-yogyah* signifies as given above in one sense, and "fit for the visits of the divinities" in the other.

‖‖ Here is another play upon the term *sthiti-chalita-sakala-bhúbhrítpakshach-*

Lakshmí from the ocean, or like Párwatí from the Himálayás, the lord of the mountains, was born from Angandeva, very strong in force, the son of Arjjun, who became by his virtues the senior son of the aforementioned Kokkal, who was a descendant of the Haihaya race that broke down the pride of Ráwan) became Queen of Indraráj. Their son Govindráj, who surpassed Kám in beauty, who never committed wicked deeds, although with full opportunity, who never dishonored the elders, nor brought disgrace on himself by perpetrating evil actions, such as going with a brother's wife, &c., nor ever acted the coward's part by assuming derangement to cloak misdeeds, who signalized himself in the world as adventurous only in charity and war, became the next king. He poured forth bounties like rain upon his people, so that he at last was said to have inundated the whole creation with gold. The earth, finding herself rid of her wicked rulers at the height of his triumph over the world, commenced to dance for joy, raising, as if to gesticulate, her hands, the flapping banners of supremacy.* The sun and moon also, knowing that this victorious king does not bear with any insolent and inimical ruler,† became terrified, and submissively ran like heralds before him. Princes and authorities bowed themselves down before his ever-victorious palace, shining with his lustre, having its external gateway lofty, and shaped like the moon. Has it actually happened that the Ganges and Yamuná have poured themselves into and watered his kingdom because of its superiority over all others in virtue and genius? While this victorious king has been peaceably reigning, his virtuous kingdom has been freed from all enemies, and the expression "Vimána," an evil character, is understood only as a celestial vehicle,‡ to the truth of which parrots even bear testimony. The soot of the numerous fumes, rising from the fire of his great valour in battle, produced another heaven of azure clouds, in which the rays reflected whilst brandishing the glittering swords, are the flashes of lightning and the pearls‖ that drop in breaking the temples of the stubborn and hostile elephants, shine like the stars. His fame so pervades and saturates the universe, that the moon, the milky

ched-á-bhimukta-bhuja-wajrah, signifying as given above in one sense, and also "hurling out of his hand a thunderbolt to deprive all the flying mountains of their wings."

* Páli, called also Padhi, in some of the previously-translated plates.

† The words *Param mandaládhípam*, signifying as above, and also "other lord of circle (disk or system)," such as the sun and moon, a raja in his darbár, &c.; hence the allusion to the sun and moon lost in the translation.

‡ An untranslatable play upon the double meaning of the word *Vimána*.

‖ This metaphor is founded on the popular belief of the elephant's forehead containing a pearl.

ocean, and the thousand-headed snake, are the produce of its superfluity. It is no wonder that enemies succumbed to his authority when he desired to search out and exterminate all such,* for even the conscious lotus,† being terrified, but knowing its concealment under water still more dangerous, implored mercy, as it were, by offering Lakshmí to him out of its bud.‡ *The Pandanus odoratissimus* took, as if through fear, shelter in a valley, under a mist of its own odoriferous particles, scattered by the wind; but the jack-tree‖ and cane§ saved their lives by becoming vassals, and standing at the doors¶ of his palace. The king by his beauty rivalling that of Kám, has become another Nityakandarp,** thus deriding Mahádeva's third fiery eye, for having in vain burned up and made Kám "Anitya Kandarpa."†† He has been so richly blessed with energy, nursed by counsel and valour, the other two constituents of royal strength, that he thought little of even Indra's happiness. He, a second Brahmá amidst the Chánakyas,‡‡ a Naráyan,‖‖ on account of his being devoted to the welfare of the world, subjugated by his unparalleled valour, became also a Trinetra,§§ living as it were within the inimical breasts¶¶ that he had himself torn open with his plough. This blessed king of kings (independent, and ever most desirous of maintaining his supremacy, called Suwarnawarsh, and also for universal popularity Wallab,h Narendra Deva, *** constantly meditating on the feet of the prosperous and independent Nityawarshadeva, and a great teacher and a king of kings) orders all ministers, mánkarís,††† rulers of kingdoms and countries, principal

* Here is an untranslatable play upon the double meaning of the word *Kantaka*, which means "thorns" as well as "enemies."

† A particular species of red lotus, having thorns.

‡ Here is a play upon the word *kosha*, which means "a bud," and also "treasury"; Lakshmí dwells in both the lotus-bud and treasury.

‖ The jack-tree, though itself not thorny, bears a fruit covered with prickles.

§ Porters and mace-bearers generally stand with their canes at the doors, hence the allusion.

¶ Door frames are generally of jack-wood.

** That is, "everlasting or imperishable Kám."

†† That is "transitory or perishable Kám."

‡‡ May be perhaps the descendants of Chánakhya, the name of a sage, now applied to a man of prudence.

‖‖ That is, Vishnu.

§§ The Three-eyed, a title of Mahádeva.

¶¶ One of Shiva's epithets is *Smashanawási*, or "dweller in cemetery," hence this far-fetched metaphor.

*** This, signifying "the darling of kings," is the king's sixth epithet.

††† The persons entitled to certain honors and presents rendered at courts, councils, festivals, village-assemblies, &c.

villagers, respectable men, and all who are tenacious of their dignity. Be it well known unto you that the king, who with a view of promoting his own and his parents' virtue and fame by a long continuance of his capital, shielded by wise counsellers, even restores bygone grants to gods and Bráhmans, and who daily issues by hundreds innumerable edicts of village-grants, on Thursday, while the moon is in the mansion Púrwabhádrapada, the 15th of Shráwan [July, August], in the Samvatsar of Vijaya 855 years having passed of that era, has given in Inám, till the sun and moon endure, formally pouring water* from the hand, the village Lohagrám in Rámpurisaptashat, with all the trees thereon, exempt from payment of grain or gold,† and from the ingress of the military, to Keshava Dikshit, son of his fellow-student Dámodar Bhatta, born in the city of Pudawardhan, a descendant of Kaushik and a Kánwa‡ sectary. The undisputed boundaries of the village so granted as never to be coveted back, are Ghodégrám on the east; Wajulí village on the south; Vinchaviharabh village on the west; and Sonanhí village on the north. No one should ever interfere with Keshava Dikshit, or his posterity, whilst they are cultivating or enjoying, or suffering the village to be cultivated or enjoyed. Future kings, either of my own or other lineage, who may know that wealth is as transient as the waves undulated by a hurricane, life as the summer clouds, and also that preserving an assignment of land is more meritorious than granting it, which is their common duty, should duly observe and protect this our grant. Rám has said "To give land, and thus build a bridge, to pass, as it were, over an ocean of sin, is a duty, common to rulers. But O! you future kings, to protect this bridge of charity from time to time is the repeated solicitation of your suppliant Rámchandra." It is also said that he who gives land abides sixty thousand years in heaven, but a resumer and an abettor in its resumption are doomed to pass the same number of years in hell. He who takes back land given either by himself or others, becomes a worm, and rots along with his ancestors in his own hell; charity given by a single handful,‖ or resumption of what is given, destroys the merit of all former donations. He that gives land dwells myriads of years in the heaven of Bramhá. Be there blessings throughout the creation. Be our salutation to Shiva.

* A practice observed at the time of making a donation, to intimate relinquishment of right over it.

† A few words following are unintelligible.

‡ A particular section of the Yajurved.

‖ Giving with a double handful is held meritorious by the Shástras.

No. II.

Translation of Plate, dated Shaka, 1182, a. d. 1261.

1182 years having passed of the blessed Shálivan era, Raudra being the current year, Saturday, the 7th of the fortnight of the waning moon of Paush (December, January).

He who has been honored with the title of the five great words, as Ráy, Dharaní, Waráharáy, Batkáraripuráy, Sáhus Malha, and Shrí Kánvadeva Ráy, residing in the best city of Kalyán, a descendant of a Kárn* in the Kaliyug, a sun causing the bud of the lotus-like Chálukya race to bloom, whose flag carries the golden boar, the ocean of truth,† a fulminating cage for sheltering refugees, a devout worshipper of Maheshwar,‡ lord of the empire gained by propitiating Mahádeva by devotion, a black bee sucking the mellifluous lotus-like feet of Shrí Kedárdeva, since the time of the accession to the throne of Kánvadeva, Keshava, surnamed Mahájani, has been the Minister. This noble statesman, who is pious, prudent, skilled in arts, whose advice is the head ornament of all great councillors, during the merit-giving time of the sun's entrance into Capricorn, has devoutly and spiritual-mindedly assigned the village of Terawátak,‖ which he had obtained by the favor of the Rájá, with trees, and other usually grant-accompanying things, together with all its produce, with power to punish crimes and correct morals within its boundaries, to Keshava Prabhu, of the Bháradwáj lineage, who is to supervise the eight sacerdotal duties,§ and to the following deity and other nineteen Bráhmans, pouring water on their hands, and issuing this edict to Goi Raul, son of Jálhun Rául. The land called Rhát Síwár,¶ enjoyed by the Shúdras, is assigned to the deity Vimaleshwar, and the land lying near the temple, to Mádhava Deva, of the Bháradwáj lineage, for the daily worship of, and offerings to the Deity. The remaining Bráhmans are,—3, Nágde Kramait, of the Bhárgava lineage; 4, Vithal Paishás, of the Káshyap race; 5,

* The name of the half brother to the Pándavas, famed for munificence.

† Or "a mine of precious truth."

‡ Mahádeva.

‖ Now called Terwan, near Rájápur Táluká, Vejedrug.

§ 1, sacrifices, &c; 2, consecration of gods, wells, gardens, &c. &c.; 3, the ceremonies closing and concluding long religious observances; 4, predicting eclipses, interpreting them, telling auspicious seasons for undertaking any work; 5, consulting the religious code of laws and institutes, and prescribing therefrom penances, &c.; 6, preaching the Puráns; 7, administering justice; 8, supervision of the religion of the country.

¶ Perhaps Bhat Síwár.

Vithal Paishás, of the Bhárgava lineage; 6, Ukal Paishás, of the Bháradwáj lineage, on whom is bestowed the Bramhatara; 7, Govind Bhat, of the Gárgya lineage; 8, Somde Bhat, of the Atri lineage; 9, Somde Kramait, of the Vasishth lineage; 10, Keshava Bhat, of the Vasishth lineage; 11, Mádhava Bhat, of the Káshyap lineage; 12, Wasudeva Bhat, of the Mudugal lineage; 13, Paduman Bhat, of the Vásishth lineage; 14, Mádhava Bhat, of the Gárgya lineage; 15, Achyut Bhat, of the Atri lineage; 16, Wáman Bhat, of the Káshyap lineage; 17, Náráyan Bhat, of the Bháradwáj lineage; 18, Náráyan Thákur, of the Bhárâdwáj lineage (on whom the office of a Chaudharí, and of a protector of the village is bestowed); 19, Harideva Bhat, of the Bháradwáj lineage; 20, Tikal Bhat, of the Bhárgava race. Four orchards, called Karhátak, are assigned to the holy purpose of permanently supporting the Math,* which is provided with culinary copper vessels, and situated near the temple. Kings, descended either from the present or other ruling race of this country, must so piously preserve this village grant, as to become enjoyers themselves too of beatitude. Many kings, as Sagar and others, made land-grants, but whosoever is the lord of the land, to him belongs the merit of preservation thereof. The resumer of land given either by himself or others, passing sixty thousand years as a worm in hell, is born a wretched Chandál. He that seizes one tola of gold, or a cow, or a bit of land, even of a finger's breadth, is doomed to remain in hell till the annihilation of the elements. It is recorded that no poison should be named equal to the seizure of Bráhmanical property; for the former destroys merely the one that takes it, but the latter also one's posterity. To all future rulers, either of my or other race, who will preserve this my grant, I bow down. This is written by Govind, the auspicious Maheshwarí.

* The nearest word for this is perhaps "convent."

No. III.

Translation of Charter, dated Shaka, 1313, a. d. 1391.

Be our salutation to Mahádeva, over whom waves as a chowrie the lofty head-kissing moon, who is like the Múlastambha* for the erection of the universe. Be glory to the boar Vishnu, who came into existence of his own will, and on whose tusk the globe of the earth looks beautiful as a lotus flower on its tube-like pedicle. The gold mountain Meru rests elegantly on the flower-like globe as the pericarp of the lotus. Bhárat (India) and the other continental divisions form the petals of the globe. The seven mountains Kuláchal, &c. that surround the pericarp (Meru) are the stamens, which add to the beauty of this flower. India is one of the petals. In its southern half is situate the country of Karnátak, through which flows the well known and great river thereof, Tungabhadrá. Even its sacred banks are so efficacious as to burn up a forest of sins. On one of the banks is the place of the great god Virúpáksha.† This place is supposed to have the same degree of sacredness as the Ganges. In its vicinity stands the fortified and impregnable capital city Vijayá, where the females have lotus petal-like long eyes, and possess such exquisite beauty as to resuscitate and rouse up even Kám, burnt up by Mahádeva.‡ As a divine incarnation, in the family of Yadu, Bukkaráj‖ was born of Shrí, wife of Achyut. He was dreadful in war; he defied all his enemies, and lived here as an Indra (god of gods). His son Harihar,§ powerful as Indra, went forth to conquer the world. He is worthy of the name, for his name and virtues are the same as those of Vishnu and Shiva. He, whilst ruling the religion formed by the northern bank¶ of a river, heard of but not seen,** the Eastern sea, Ráma's pool, and the Western sea, the great Kings of all the world fall at his feet. By his order his

* The name of a particular stone column, carved, and its capital with various grotesque figures, erected before the undertaking of any structure.

† Now called Hampivirupáksha.

‡ The Indian Cupid, of whom it is related that one day when attempting to subdue Mahádeva, while absorbed in meditation, he was burnt up by the god's third fiery eye.

‖ Also called Bukkana.

§ Vishnu and Shiva.

¶ The original appears to include the river.

** Perhaps the river Indus, or Attak, which the Hindus are prohibited by their religious code to cross.

Prime Minister Mádhava* began to rule Jayantipur, the effects of whose sound policy are so admirable that his enemies, while living, enjoy not a moment's rest. His name resounds in every quarter. He, at the head of a large army, set out, with an intention of subduing countries. A capital, surrounded by a sea, in the Konkan, and bearing the name Goa, was environed by an ocean of his forces. This heroic Minister banished all the numerous Turashkas† infesting the country, and set up again Saptakotishwar, and the other ancient idols that had been rooted up and thrown away by them. But Harihar, there consulting with his Ministers, concluded that his empire would be of short duration if the Prime Minister were not in his own territory. He therefore recalled the Minister, and bestowed on him the throne of Jayantipur, of which he was now the anointed ruler. Another Minister, Narahari, a descendant of Atreya, and the son, by Amlika, of Bramharas, a Bráhman, well versed in the Vedas and Shástras, was sent out to Goapur in his room. Narahari's younger brother, Bháskar, is well known. Narahari, a king-like personage, reared up by the rain of ambrosial satisfaction, derived from the favor of benign knowledge, as it were a Shankar‡ and thus becoming a Kalpataru‖ to all the learned of his age. Fame, a bride, previous to her wedding with the Minister, presented the renown of all his enemies as the offering of Lahya (parched rice) to the sacred fire of his prowess: she sat on the marriage slab,§ then stepped upon the seven continents, and proceeded to the heavens, as if to visit and receive personally a blessing from Vasishtha's wife Arundhatí.¶ The happy and wealthy Mádhavaráj, the chief of great ministers, and the guide of spiritual worshippers, says: "On Wednesday, during the time of the solar eclipse, when charitable deeds are highly meritorious, in the month of Vaishákha (April and May) of the Shálivan current year Prajápati 1313, A. D. 1391, I assign, with the pouring of water into which gold has been dropped, as a religious endowment, the village

* The Hindu author who wrote a commentary on the Vedas and works on the laws and institutes of Manu, on theology, astronomy, physic, and other subjects, which are extant, and held in great estimation.

† The Pandit asserts that a tribe of Mahomedans, who had established themselves at Goa, were so called. The flesh-eating Turashkas are mentioned in a plate found near Attok, assigned to about the eighth century, in the collection published in Vol. VI. Rl. As. Soc. Journal, the word being translated "Turks."

‡ Name of Mahádeva, implying good doer.

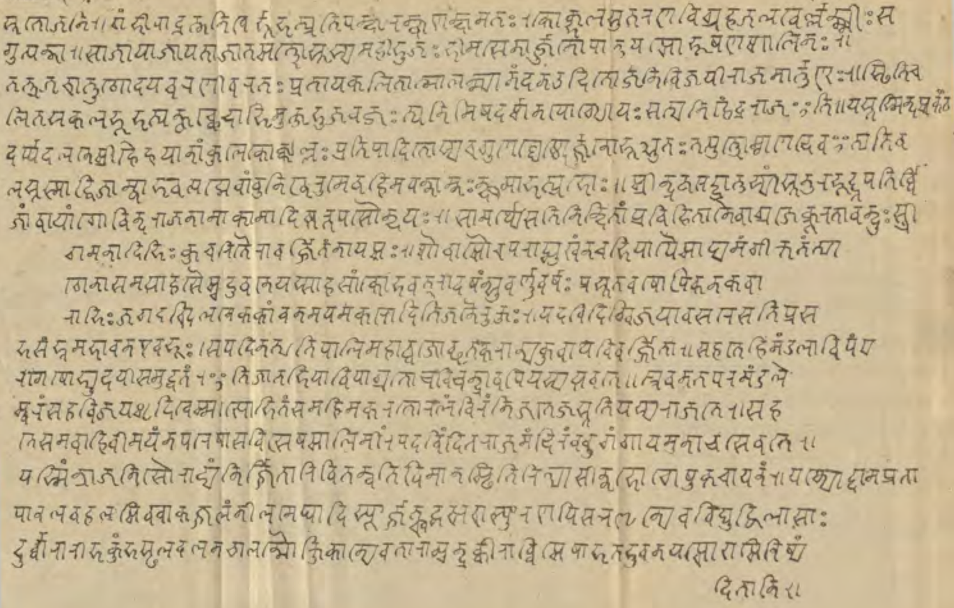
‖ A fabulous tree, nourished by ambrosia, which yields whatever may be desired.

§ Or the crest of a mountain.

¶ A goddess of chastity. This metaphor is throughout founded on the practice of Vívahahoma, a ceremony essential at all weddings.

[illegible]

Plate II. (?).



यस्मिं कूटकाम्रादकात्सुकमम श्रीं स्राजमात्मिर्रूव दाम्र वंकपल्लुकासत्रसतिल्ल श्रीः कृतापायमं के
तकापतलाल्लसद्भिजनजः पुंजोदकानादरदूराद्रूपमस्मनावकुलतया द्वार्यामसुष्टो दितंनायमुसमु
पहसितहरनयनदद्वनविदितानित्य कदर्पेरूपस्तोचर्यदर्पः श्री नित्य कदर्पः प्रदुमंद्रसकूरपैहि
तोसाहसकिसमाकिमसतमुदयसुवस्मा एवादकुर्मुदवः प्रथितैकविक्रमाक्रांतवसुंदनाहितकनलप
नायणः श्री विक्रांतनारायणः स्वकरकलितहतिहलदलितदिपकूपकुलकूटः श्री कृपतितलाटः ॥
समरदवस्वपरमरूपकमहाराजाधिराजपरमेश्वर श्रीमत्रिय दर्वादेवपादानुध्यातपरमरूप
कमहाराजाधिराजपरमेश्वर श्रीमत्रुव र्नुवर्षदेवपश्चीवल्लभश्रीमद्वल्लभनरेंद्रदेवः कुशलासर्वान्नि व
यतासंवत्स मानकाकृष्टपतिविषयपतिग्रामकूटमहत्तरयुक्तकापपुरुकादिका
निकान्समादिसत्यसुवः संविदितंयथामाघदसटनाजसनीस्थितनावस्थानकमाता
पितोनाभवस्थुपुण्ययसोभिवृद्धयेत्तर्हसुमानपिदवत्तागाग्रहानाम्नु निपालय
नाप्रतिदेंचकिनवदितमस्यग्रामस्यासवाविंशतिः प्रयद्धतामकरपकालातीतसंवत्सर
शतेषुपंचपंचाशदधिकेषुकालातिसंवत्सरातेंराजा प्रवर्तुनामादक्षयसंवत्सरांतर्ग
तश्रावणपौर्णमासीवासरेनाः प्रवर्द्धमानपदानकाकुप्रधनकानादकातिसर्वेण ॥ पुंडव
र्द्धनवानविनिर्गतकौशिकसवाकुवाजिकावसद्भचालिदालादनरुद्रसुताय
कसवदीन्द्रितायनामेपुरीसपूस्तांतर्गतलाहग्रामःसहकूलाभाकुलभःस
दाग्रहिनएरदयःसदलदाषदमायपावसरूतापाठप्रत्यः त्रावाटहटप्रवस

सतोतुनाथोब्रह्मद्रायस्यायेकाचंद्रार्कं कमस्योदतुः यस्यचाघाटाः पूर्वतः घोटा
ग्रामः दक्षिणतः वंजुलीकामाग्रामः पश्चिमतः विचंविहनरुकामाग्रामः उत्तरतः
सोकहीकामाग्रामः एवंचतुराप्पार विसुद्धंलोहग्रामंकेशवदीक्षितस्य कृपतः क
र्षयतोहुंजतोहोजयतोवाककेविद्याघातः कार्यः मन्दाकिलाक्षोलितजलतरंगात
रलमैसूर्यसरवरहुविद्रुमंजीवितंसामान्यंचहमिदाकपालमवगाहद्धिः नागा
मिकृपतिहिचस्मद्वंश्यैर्वायमस्मद्वर्मदायः समकुमंतव्यः प्रतिपालकीयश्च ॥ उक्तं
च नामरुद्रेण ॥ सामान्योयंवर्मासेतुर्कपालंकालेकालेपालकी
योहवद्भिः सर्वाकेवंहाविकः पार्थिवेंद्राकूयोदूयोयाचते
नामरुद्रः ॥ षष्टिवर्षसहस्राणिस्वर्गेतिष्ठतिभूमिदः ॥ आच्छेत्तुचाकुमं
ताचताक्येवकरकेवसेत् ॥ स्वदत्तांपरदत्तांवायोहरेतुवसुंधरां
स्वविष्ठायांकृमिर्भूत्वापितृभिस्सहपच्यते ॥ प्रसत्यासंप्रदाकेकद
तस्याहरणेकव ॥ जन्मप्रभृतियद्दत्तंतत्सर्वंनिष्फलंभवेत् ॥ क
ल्पकोटिसहस्राणिकल्पकोटिसताकिच ॥ निवसेद्ब्रह्मणोलो
केभूमिदाकंददातियः ॥ शिवमस्तुसर्वजगतः ॥ ॐ नमः शिवाय ॥

Table explanatory of the Plate Character: (ऽऽ ऽ ऽ ऽ) A.D. 933.

Modern Nagari Letters	Corresponding English Letters	Plate Character: Diff.t forms of the same letters				Modern Nagari Letters	Corresponding English Letters	Plate Character: Diff.t forms of the same letters				Kinds of Vowels or Vowels to which the Vowel marks belong	Modern Vowel marks	Plate Vowel marks: Diff.t forms of the same Vowel marks	
अ	a	अ*	अ			ट	ta	ट							
आ	ā	आ*				ठ	tha	ठ							
इ	i	इ*				ड	da	ड							
ई	ī					ढ	dha								
उ	u	उ				ण	na	ण*	ण						
ऊ	ū					त	ta	त				a	—	—	
ऋ	ṛi					थ	tha	थ	थ			ā	⊤	⊤	⊤
ॠ	ṛri*					द	da	द							
ऌ	ḷi					ध	dha	ध*				i	⊢	⊢	
ॡ	ḷli					न	na	न							
ए	e	ए				प	pa	प				ī	⊤	⊤	
ऐ	ai					फ	pha	फ*				u	⊔	⊔	⊔
ओ	o	ओ				ब	ba	ब*	ब*						
औ	au					भ	bha	भ				ū	⊔	⊔	
अं	aṁ					म	ma	म							
अः	aḥ					य	ya	य	य			e	⊥	⊥	⊥
क	ka	क	क	क		र	ra	र*	र*	र		ai	⊥	⊥	
ख	kha	ख	ख	ख		ल	la	ल	ल*						
ग	ga	ग				व	va	व				o	⊤	⊤	
घ	gha					श	sha	श*	श*	श	श	au	⊤	⊤	
ङ	ṅa					ष	sha	ष							
च	cha	च*	च			स	sa	स	स*	स	स		+	+	+
छ	chha	छ*	छ*	छ	छ*	ह	ha	ह*	ह						
ज	ja	ज				क्ष									
झ	jha					ज्ञ	kshā	क्ष				aḥ	⊤	⊤	
ञ	ña						jñā								

X Viz. in Italic, n is used to represent the sound of the Anuswar, when followed by any of the letters after ङ ma.

.... Dotted letter indicates that its exact form is somewhat doubtful.

X Letters thus marked are different from any to be found in Prinsep's Table.

Most of the unmarked letters resemble those of the Kutila inscription Table (A.D. 992).

Kuchchár, called also Mádhavapur, in the country of the same name, Kuchchár, in twenty-five allotments, to twenty-four Bráhmans, who are well versed in the Vedas and Shástras. Their names and lineage are as follows: Two of the allotments, the first and twenty-fifth, are given to Damodar Bhat, son of Anant Bhat, a descendant of Bháradwáj; the latter is granted to him as supervisor over the other Bráhmans. 2nd, to the grandson of Mahádeva Bhat, and the son of Anant Bhat, a descendant of Vasishtha. 3rd, to Wasudeva Bhat, son of Narasinha Bhat, a descendant of Attreya. 4th, to Khán Bhat, son of Anant Bhat, a descendant of Bháradwáj. 5th, to Dámodar Bhat, son of Wasudeva Bhat, a descendant of Attreya. 6th, to Mahádeva Bhat, son of Naram Bhat, a descendant of Attreya. 7th, to Wáman Bhat, son of Mahádeva, a descendant of Jamadagni. 8th, to Rhám Bhat, son of Dámodar Bhat, a descendant of Attreya. 9th, to Kán Bhat, son of Anant Bhat, a descendant of Bháradwáj. 10th, to Paumnideva Bhat, son of Vithal Bhat, a descendant of Jamadagni Watsa. 11th, to Anant Bhat, son of Mahádeva Bhat, a descendant of Kutsa. 12th, to Anant Bhat, son of Keshava Bhat, a descendant of Jamadagni. 13th, to Janárdan Bhat, son of Govind Bhat, a descendant of Attreya. 14th, to Vishnu Bhat, son of Rámkrishna Bhat, a descendant of Jamadagni. 15th, to Hari Bhat, son of Dámodar, a descendant of Attreya. 16th, to Govind Bhat, son of Mandeshi, a descendant of Kaushik. 17th, to Wásudeva Bhat, son of Vithal Bhat, a descendant of Jamadagni. 18th, to Paumnideva Bhat, son of Govind Bhat, a descendant of Kaushik. 19th, to Mahádeva Bhat, son of Hari Bhat, a descendant of Jamadagni Vatsa. 20th, to Tán Bhat, son of Náráyan Bhat, a descendant of Vasishth. 21st, to Bhatam Bhat, son of Mahádeva Bhat, a descendant of Jamadagni Vatsa. 22nd, to Vithal Bhat, son of Námdeva Bhat, a descendant of Bháradwáj. 23rd, to Mahádeva Bhat, son of Wámdeva Bhat, a descendant of Bháradwáj. 24th, to Keshava Bhat, son of Govind Bhat, a descendant of Vasishtha.

The boundaries of the so-granted village Kuchchár, hence called Mádhavapur, are as follows: Pát lies to the East of it; a Banian tree and a stone, situate on the summit of the intervening hill, form the Eastern boundary line. Mhápan lies to the south; a salt marsh, by the name of Paragati,* in the jungle, forms the Southern boundary-line, from which runs Westward the dam of a smaller marsh: near this is a ravine† on the breach of the sea; the sea lies exactly to the West.

* Now called Paragalwi.

† Also ditch, pit, deep hole, chasm.

Paraulya* lies to the North; the Paulot† and the creek beneath it, that runs to the sea, form the Northern boundary line. The grant of this village, with all its appendages, trees, water, treasure, if found, and everything thereon, is made by the consent of the king, his ministers, the chief men of the village, exempt from all sorts of taxation and oppression, to the above mentioned Bráhmans, who may undisturbedly enjoy it. To preserve what has been granted, a common duty incumbent on all kings, is like a bridge for their safety, over an ocean of sins. O you monarchs! preserve this bridge at all times, is the constant prayer of your supplicant Rámachandra. He who removes what is granted, either by himself or others, is doomed to pass sixty thousand years as a worm in hell.

* Now called Parule or Parole.

† We have no good English word for this useful term, signifying the line of any ridge or portion of land from which the water turns in opposite directions.

TRANSCRIPT OF CHARTER, DATED SHAKA 855, A. D. 933.

[*The asterisk * denotes the end of each line in the plates.*]

७ जयति ब्रह्मणः सर्ग्ग निष्पत्ति मुदितात्मनः सरस्वती रूतानंदा मधुरास्साम गी
तयः ॥ तारा चक्राब्ज * षंडा वृतगगन सरष्पद्मिनी राजहसा । त्रैलोक्यैकाधिप
त्य स्थित मदन महाराज शुद्धात पत्रात् * लावण्य क्षीरसिंधो द्युतिरजतगिरे
द्दिग्व धूदंतपश्रा । द्वंशःसोमादयं यस्त्रिभुवन कमलावास * सौधा दुपेतः ॥ तस्माच्छि
यः कुलगृहं भवनं महिम्नः क्रीडास्पदं स्थितिमहर्द्धी गभीरतानां * त्रायन्नसत्व प
री पालन लब्धकीर्त्ति र्व्वशोबभुव भुवि सिधुनिभोयदुनां ॥ परिणतपर मंडलः क
ला * वान् प्रविततबहलयशोंशु पूरिताशः । शशधरइव दंन्ति दुर्गराजो यदुकु
ल विमलवियत्यथोदिया * य ॥ तस्याद्यं नृपतेः पितृव्य उदयी श्रीवीरसिंहासनं मे
रोः शृंगमिवाधिरुह्य रविवद्धि * कृष्णराजस्ततः । ध्वस्तोदृक्त चलुक्यवंशतिमिरः
पृथ्वीभृतां मस्तके न्यस्तादृः सकलं * जगतप्रविततै स्तेजोभी राक्रांतवान्॥तस्मा द्गो
विन्दराजो भूविन्दु बिम्बशिलातले यस्यारि * प्लोषधूम्रो कः प्रशस्तिरिवलक्ष
ते॥तस्याभवदभुवन पालन वीरबुद्धि रुद्धूतशत्रु कुल संतति रिद्धतेजाः । * राजानुजो
निरुपमा परनाभधेयो यन्मुद्रयांबुधि रपि प्रथितः समुद्रः ॥ तदनुज गत्तुंगो जनी
परि * हत निजसकल मंडलाभोगाः गतयौवन वनिता जन कुचसदृशा यस्य
वैरि नृपः तस्मा च्चा * मोघवर्षो भव द तुलबलो येन कोपादपूर्व्वैश्चालुक्याभुषखा
द्यै र्ज्जनितरतियमःप्रीणितो विंग * वल्ल्या ॥ वैरि चांडो दरांत र्व्वहि रुपरितले य
न्नलब्धा वकाशं तोयव्याजाद्विशुद्धं यशइव निहितं तज्ज * गत्तुंगसिंधौ ॥ तस्मा द
कालवर्षो नृपति रभुद्यत्पराक्रमत्रस्तैः सद्यः समंडलाग्रं खेटकमहि * तैः परित्य
क्तं॥ सहस्राज्जुनवंशस्य भुषणं कोक्कलात्मजा । तस्या भवन माहादेवी जगत्तुंग *

स्ततोजनि ॥ गंभीराद्रत्ननिधे र्भुभृत्प्रतिपक्ष रक्षणक्षमतः कोक्भल सुतरण विग्रह ज

लघेलक्ष्मीः स * मुन्ना ॥ सा जाया जायताजातश्चो स्य महीभुजः भीमसेना र्ज्जुनो पात् यशो भुषण शालिनः ॥ * तच जगत्तु गोदयधरणीधरतः प्रताप कलितात्मा लकन्म्या नंदन उदितो जनोविजयो राजमार्त्तण्डः ॥ स्थिति च * लितसकल भूभृत्पक्षच्छेदाभिमुक्त भुज वज्रः अनिमिष दर्शनयोग्यो यः स त्यमिहेद्रराजइति ॥ यस्तस्मिन्दशकंठ * दर्प दलने श्रीहैहयानां कुल कोल्ल स्तः प्रतोपादितोस्य च गुणश्रेष्ठो र्ज्जुनोभूत्सुतः ततपूर्वो मृगणदेव इत्यति ब * ल सस्याद्विजामवाभव त्पद्मे वांतुनिधे रमेव हिमवन्नाम्नः क्षमा भृत्प्रभोः ॥ श्रीनृ मरेंद्रात्तस्यां सूनुरभुद्भूपतिर्द्धि * जांबाया गोविन्दराजनामा कामाधीक रूप सान्दर्यः ॥ सामर्थ्यं सति निन्दितां प्रविहिता नैवाग्रजेक्रूरता बन्धुः स्त्री * गमनादिभिः कुचरितै रावर्ज्जितं नायशः ।शौचाशौचपराङ्मुखं नच भिया पैशाचमं गीकृतंत्या * गैना समसाहसै श्च भुवने यस्साहसां कोभवत् ॥ वर्षन् सुवर्णवर्षः प्र भुतवर्षोपि कनक धा * रामिः जगदखिलमेक काचनमयं मकरो दितिजनैःस क्त ॥ यदधि दिग्विजया वसरे सति प्रस * भ सैंभ्रम भावन एवभुः । सपदि हत्यति पाली महाध्वजो कृतकरान्यकुनाथ विवर्ज्जिता ॥ सहते हि मंडलाधिपं प * रे मे षो भुदयो समुद्धतं ॥ इतिज्मतभीया धिया ग्रतो रविचन्द्रा वपि यस्य धावते ॥ अ वन तपरमंडले * श्वरं सहविजयश्रृभिवेश्मशोभितं समही मकरतोरणं चिरं नि ज तेज स्तति यस्य राजते ॥सह * ते समताहि धोमयं नपरेषा सविशेशालिनी ॥ यदनिदित राजमदिरं ननु गंगा यमुना च सेवते * यस्मिन्राजनि सौराज्य निर्ज्जितारि वितन्वति विमान स्थिति रित्यासी न्नभोगेषुकवाचनं ॥ यस्यो द्दाम प्रता * पानल यद्दल शिखा कज्जलं नीलमेघा वीस्फूर्ज्जत् खड्गधारा स्फुरण वि सरणा न्येव विद्युद्विलासाः * दुर्वारारोभकुंभ स्थल दलनगल न्मौ क्तिकान्येव ता रा श्चंद्र क्षीराब्धि शेषामृतभुवनयशो राशिनिष्यंदितानि ॥ *

यस्मिन् कंटकशोधनो त्सुकमनश्च भाजनालैर्भृ ये वान्मग्नं नपयस्सु कोश्वसति लक्ष्मीः कृतोपायनं के * तक्षा पवनोज्ञ सन्नि जरजः पुंजांधकारोदरे भूगर्भेपनसेन वेच लतयाद्वार्थो त्म शुध्यैस्थितं ॥ यश्चं समु * पहसित हरनयनदहने विहिता नित्य

कन्दर्प्परूप सौंदर्यदर्प्पः श्री नित्यकन्दर्प्पः प्रभु मंत्र शक्त्युपबृंहि * तोत्साह शक्ति समाक्षिप्त शतमुखसुख श्चाणक्य चतुर्मुखः । प्रथितैक विक्रमाक्रांत वसुंधरा हितकर ण प * रायणः श्रीविक्रांत नारायणः । स्वकर कलीतहेतिहलदलित विपक्ष व क्षस्थल क्षेत्रः श्रीनृपतितृणेत्रः ॥ * समभव त्सच परमभट्टारक महाराजाधिरा जा परमेश्वर श्रीमन्नित्यवर्षदेव पादानुध्यात परमभट्टार * क महाराजाधिराजा परमेश्वर श्रीमत्सुवर्ण्ण वर्षदेव पृथ्वीवल्लभ श्रीभद्वल्लभनरेदेवः कुशली सर्व्वानेव * य तासंद्र त्यमानकान् राष्ट्रपति विषयपति ग्रामकूट महत्तरयुक्त कोप युक्तकाधिका * रिकान् समादिशत्यस्तु वः संविदितं यथा मान्यखेटराजधानी स्थिरतरां वस्थानेन माता * पित्रो रात्मनश्च पुण्य यशोभिवृद्धये पुर्व्व लुप्तानपि देवभोगाग्रहारान् प्र तिपालय * ता प्रतिदिनं च निरवधिनमस्यग्रामशासनानि शतसः प्रयाच्छता श कनृप कालातीतसंवत्सर * शते ष्वष्टसु पंचपंचाशदधिके ष्वकतोपि संवत्सराणां ८५५ प्रवर्तमान विजयसंत्सरांतर्ग्ज * त श्रावण पौर्ण्णमास्यां वोरे गुरोः पूर्व्वाभ द्रपदानक्षत्रे प्रथमकरोद्‌कातिसर्ग्गेण ॥ पुडव * र्द्धन नगर विनिर्ग्गतकौशिक गोत्र वाजिकाण्व सब्रह्मचारी दामोदरभट्टसुताय * केशवदीक्षिताय रामपुरी स प्तशतांतर्ग्गत लोहग्रामः सष्टक्षमालाकुलः स * धान्य हिरण्यादेयः सदण्ड दोष दशापराध सभूतोपात्त प्रत्ययः आवाट भट प्रवेश *

शतात्तरायो ब्रम्हदाय न्यायना चंद्रार्क्कनमस्योदत्तः यस्य चाघाटाः पूर्व्वतः घो डे * ग्रामः दक्षिणतः वजुलीनामाग्रामः पश्चिमतः विंचविहरभनामाग्रामः उत्तरतः * सोन्नहीनामाग्रामः एवं चतुराघाटविशुद्धं लोहग्रामं केशवदीक्षित स्य कृषतः क * र्षयतो भुंजतो भोजयतो वानकेचिद्वयाघातः कार्यः मत्दानिला न्दोलित जलतरंग त * रलमैश्वर्य शरदब्भ्र विब्भ्रमं जीवितं सामान्यं च भुमी दान फलमवगच्छद्भिः रागा * मिनृपतिभि रस्मद्वंश्यै र्व्वायमस्मद्धर्म्म दायः सनुमं तव्यः प्रतिपालनीयश्च ॥ उक्तं * च रामभद्रेण ॥ सामान्योयं धर्म्मसेतु नृपाणांका लेकाले पालनी * यो भवद्भिः सर्व्वानेवभाविनः पार्त्थिवेंद्रान् भूयोभूयोयाचते * रामभद्रः ॥ षष्टीवर्ष सहस्राणी स्वर्ग्गेतिष्ठति भूमिदः । आच्छेत्ताचानुम * ताचा

तान्येव नरके वसेत् ॥ स्वदत्तां परदत्तां वा यो हरेत्तु वसुंधरां * स्वविष्ठायां कृमि भूत्वा पितृभिस्सह पच्यते ॥ प्रसृत्यासं प्रदानेन द * तस्याहरणेनच । जन्मप्रभृ तियद्दत्तं तत्सर्व्वं निष्फलं भवेत् ॥ क * ल्पकोटी सहस्राणि कल्पकोटि शतानि च ॥ निवसेद्ब्रह्मणो लो * के भूमिदानं ददातियः ॥ शिवमस्तु सर्व्वजगतः ॥ ओंनमः शिवाय *

Facsimile with Transcript of Charter dated, Shaka, 1182 A. D. 1261.

॥स्वस्ति श्री शकु ११८२ वर्षे गौड़ संवत्सरे । पुष्य वदि ..
स्व स्ति श्री श कु ११८२ व र्षे गौ ड़ सं व त्स र । पु ष्य व दि

सप्तमि शनि दिने । अद्येह समधिगत पंचमहाशब्द
स प्त मि श नि दि ने । अ द्ये ह स म धि ग त पं च म हा श ब्द

महामंडलेश्वर । कल्याणपुरवराधीश्वर । कलियुग
म हा म ड ले श्व र । क ल्या ण पु र व रा धी श्व र । क लि यु ग

कर्णान्वयप्रसूत । चालुक्यकुलकमलकलिका विकास
क र्णा न्व य प्र सू त । चा लु क्य कु ल क म ल क लि का वि का स

भास्कर । सुवर्णवराहलाञ्छनध्वजसत्यरत्नाकर । शरणाग
भा स्क र सु व र्ण व रा ह ला ञ्छ न ध्व ज स त्य र त्ना क र । श र णा ग

तवज्रपंजर । महामाहेश्वर । महेश्वरदेवचरणप्रसादनारा
त व ज्र पं ज र । म हा मा हे श्व र । म हे श्व र दे व च र ण प्र सा द ना रा

धनोपचारादवाप्तपरमराज्येश्वर । श्रीकेदारदेवपद
ध नो प चा रा द वा प्त प र म रा ज्ये श्व र । श्री के दा र दे व प द

पंकजभ्रमर । रायधरणीवराहराय । बटकाररिपुराय
पं क ज भ्र म र । रा य ध र णी व रा ह रा य । ब ट का र रि पु रा य

साहसमल्लश्रीकांवदेव रायविजयराज्यादे । त
सा ह स म ल्ल श्री कां व दे व रा य वि ज य रा ज्यो दै । त

Plate IV (2).

द्राज्यभारचालनसमर्थ। आचारनिपुण। सारासार विचारचतुर।
द्राज्य भार चालन समर्थ। आचार निपुण। सारासार विचारचतुर।

सकलकलाकुशल। महामात्यमंत्रचूडामणि। श्री केशवमहा
सकल कलाकुशल। महामात्य मंत्र चूडामणि। श्री केशव महा

जनिना। श्री कांवटेवराय। प्रसादलब्ध। तेरवाटकनाम। धेयो
जनिना। श्री कांवटेवराय। प्रसादलब्ध। तेरवाटकनाम। धेयो

यग्रामः। उत्तरायणसंक्रांतिपर्वणि। परमया भक्त्या। महाधा।
यग्रामः। उत्तरायण संक्रांति पर्वणि। परमया भक्त्या। महाधा।

मिंकेणभूत्वा सव्रिक्षमालाकुलसोपरिकर। दंडदोषमा
मिंकेण भूत्वा सव्रिक्षमालाकुल सोपरिकर। दंडदोषमा

र्गणसहितचतुःसीमापर्यंतं। निधिनिक्षेपसहितविंशति
र्गणसहितचतुःसीमापर्यंतं। निधिनिक्षेपसहितः विंशति

विप्रसहिताय भारद्वाजगोत्रोत्पन्नाय अष्टभोगसहित
विप्रसहिताय भारद्वाजगोत्रोत्पन्नाय अष्टभोगसहित

केशवप्रभवे। हस्तोदकेन प्रदत्तः। तदर्थशासनं प्रय
केशवप्रभवे। हस्तोदकेन प्रदत्तः। तदर्थशासनं प्रय

कति। तेषामेतानि नामानि। ह्राटसीवारसंबंधिनी शू
दानि। तेषामेतानि नामानि। ह्राटसीवारसंबंधिनी शू

द्रप्रजोपजीविनी समग्र। भूमिविमलेश्वरदेवस्य। तथा
द्रप्रजोपजीविनी समग्र। भूमिविमलेश्वरदेवस्य। तथा

देवस्य संनिधौ। या भूमिः सा। भारद्वाजगोत्रस्य। माधवदेवस्य। गं
देवस्य संनिधौ या भूमिः सा। भारद्वाज गोत्रस्य। माधव देवस्य। गं

धधूपनिवेद्यार्थं। भार्गवगोत्रनागदेक्रमेत। काश्यपगोत्र विठ
धधूपनिवेद्यार्थं। भार्गव गोत्र नागदेक्रमेत काश्यप गोत्र विठ

लपैशास। भार्गवगोत्र विठलपैशास। भारद्वाजगोत्र। उक
लपैशास। भार्गव गोत्र विठलपैशास। भारद्वाज गोत्र। उक

लपैशास। ब्रह्मचसहित। गार्ग्यगोत्र गोंदभट। अत्रिगो
लपैशास ब्रह्मचसहित। गार्ग्य गोत्र गोंदभट। अत्रि गो

त्रसोमदेभट। वासिष्ठगोत्र सोमदेक्रमेत। वाशिष्ठगोत्र के
त्र सोमदेभट। वासिष्ठ गोत्र सोमदेक्रमेत। वाशिष्ठ गोत्र के

शवभट काश्यपगोत्र। माधवभट। मुदुगलगोत्र। वासुदेवभट
शवभट काश्यप गोत्र। माधवभट। मुदुगल गोत्र। वासुदेवभट

वासिष्ठगोत्र पदुमणभट। गार्ग्यगोत्र माधवभट। अत्रिगो
वासिष्ठ गोत्र पदुमणभट। गार्ग्य गोत्र माधवभट। अत्रि गो

त्र अच्युतभट। काश्यपगोत्र वामनभट। भारद्वाजगोत्र ना
त्र अच्युतभट। काश्यप गोत्र वामनभट। भारद्वाज गोत्र ना

रणभट। भारद्वाजगोत्र नारणठाकुरस्य चौधिरिक। सा.
रणभट। भारद्वाज गोत्र नारणठाकुरस्य चौधिरिक। सा

ग्रामप्रतिपालकः। भारद्वाजगोत्र हरिदेवभट। भार्गवगोत्र
ग्रामप्रतिपालकः। भारद्वाज गोत्र हरिदेवभट। भार्गव गोत्र

तिकलभट। एवमेतानि ना मानिदेवसंनिधौ। तां
तिकलभट। एवमेतानि ना मानिदेवसंनिधौ। तां

TRANSCRIPT OF CHARTER, DATED SHAKA 1313, A.D. 1391.

[The Facsimile of this Plate was not obtained.]

श्री महागणाधिपतयेनमः ॥ अविघ्नमस्तु ॥ नमस्तुंगशिरश्चुंबी चंद्रचाम रचाखे ॥ त्रैलोक्य नररारंभमूलस्तंभाय शंभवे ॥ लीलाकोलः सजयति हरिः कुं दलक्ष्मी दुघद्य द्वंष्ट्रानाले नालेननमिवभू मंडलं तद्वीभाति ॥ यत्र स्वर्णक्षितिधरपतिः कर्णिकावर्षपंक्तीः पत्रश्रेणी कुलशिखरीणः केसराणां प्रसारः ॥ तस्मिन्भारत वर्षद क्षिणदले देशोस्ति कर्णाटका स्तन्मध्ये सरिदुतमा विजयते सातुंगभद्राभिधा ॥ य त्तीरे दुरिताटवीहुतवहे देवो विरूपाक्ष इत्यास्ते संततमंतरेण सुमनः स्रोतस्वीनी चिंतनं ॥ तस्योपकंठे विजयाभीधाना सादुर्जया राजति राजधानी ॥ यस्यां विरू पाक्षकटाक्ष दृग्घ मुज्जीवयंतिस्म रमुत्फलाक्ष्यः ॥ वंशे यदो रभिनवांशईवाच्युतस्य श्री संगमादजनिसंगररंगभीमः ॥ श्रीबुक्कराज इति धिकृत शत्रुरेष तामध्यतिष्टदध मध्यमलोकपालः ॥ अथ भुवंभवगामिनः सुतं हरिहरोदीशपराक्रमम् ॥ जगदि नः समजीगमदादरा त्सचतुरं चतुरं बुधिमेखलाम् ॥ आकर्ण्णस्थ सरिद्दुरोत रतटा दापूर्वपाथोनिधे रासेतो खनिं चिरादवति सत्यापश्चिमांबोनिधेः ॥ स्थाने स्मिन् गुणनां मभिर्हरिहरो राजाधिराजादिभी राजोर्वीपति मौलिमालितपदां भो जे महीवल्लभे ॥ तस्याज्ञया माधवमंत्रिवर्यः प्रशाज्जयंती पुरराज्य मृह्यम् ॥ यन्मंत्र शक्त्या वपुरुत्सृजंतोप्यरातयाः स्वास्थ्यामहो भजंते ॥ आशांतविश्रांतयशाः समंत्री दिशो जिगीषुर्महता बलेन ॥ गोवाभिधां कौकणराजधानीं मन्येनमन्ये रुणद र्णवेन ॥ प्रतिष्ठितां सचतुरष्कसंधानुत्पाद्यदोष्णा भुवनैकवीरः ॥ उन्मूलिता ना मकरोत्प्रतिष्ठां श्री सप्तनाथादिसुधा भुजां यः ॥ तस्मिन्नृते क्षीतितले सति कीर्तिशेषं सन्मंत्रिभि र्हरिहरो नृपतिर्विचार्य ॥ गोवापुरे नृहरिमंत्रिण मादरेण राज्ये पदेसमभिषिच्य पुरोजयंत्याः ॥ आश्रयान्वयवारि धावुदभव न्मंबांबिका ग र्भतः साक्षाद्व्रसाभिधद्वीजवरा ध्यो भास्करस्याग्रजः ॥ विद्याशंकर सन्कृपा मृ तरसासारेण संवद्वीतो विद्वत्कलप महीरुहो नरहरिः क्षोणीपति र्भा सते ॥ कृत्वा सप्तपदानि सप्तसु महाद्वीपेषु भूभृच्छिला मास्थायाथ विमुच्य शा त्रवयशो लान्प्रतापानले ॥ प्रत्यक्षेण विलोकितुं दीवमपि प्राप्ता तथारंधति मित्थं कीर्तिवधूः सदा नरहरि क्ष्मापं वृणीते वरम्॥ स्वति श्री शके त्रयोदशाधिक त्रिशतो तरसहस्रे गते वर्तमान प्रजापति संवत्सरे वैशाखमासे कृष्णपक्षे अमावास्यायां सौम्यदिने सूर्योपराग पुण्यकाले स्वस्ति श्रीमन्महा मंत्रीश्वर उपनिषन्मार्ग प्रवर्तका चार्यः श्री मन्माधवराजः कुचरविषय वर्तिनं कुचरनामानं ग्रामं माधवपुरमिति प्रथीतनामधेयं सर्वमान्यमग्रहारं कृत्वा पंचविंशति वृति कल्पनामा कलप्य श्रुता

ध्ययनसंपन्नेभ्यः चतुर्विंशति ब्राम्हणेभ्यः सहिरण्योदकदान दारापुवकं तं ग्रामं संप्रद द इति प्रदतं धर्मशासनं तेषां ब्राम्हणानां गोत्र नाम विवरणम् ॥ भारद्वाज गोत्र स्य ऋक् शाखाध्यायिनः अनंतभट्ट पुत्र दामोदरभटस्य वृतिरेका १ वासीष्ट गो त्रस्य ऋक् महादेव पुत्रानंतभट पुत्रस्य वृतीरेका २ आत्रेय गोत्रस्य ऋक्० नार सीहभट पुत्र वासुदेवभटस्य वृतिरेका ३ भारद्वाज गोत्रस्य ऋक्० अंनंतभट पुत्र दामोदरकानभटस्य वृतिरेका ४ आत्रेय गोत्रस्य ऋक ० वासुदेवभट पुत्र दा मोदरभटस्य वृतिरेका ५ आत्रेय गोत्रस्य ऋक् ० नारंभट पुत्र महादेवभटस्य वृतिरेका ६ जांमदग्न्य गोत्रस्य ऋक् ० महादेव पुत्र वामनभटस्य वृतिरे का ७ आत्रेय गोत्रस्य ऋक ० दामोदरभट पुत्र रामभटस्य वृतिरेका ८ भारद्वाज गोत्रस्य ऋक् ० अनंतभट्ट पुत्र कानभटस्य वृतिरेका ९ जामदग्न्य वत्सगोत्रस्य ऋ क् ० विठलभट पुत्र पौम्नीदवभटस्य वृतिरेका १० कुत्सगोत्रस्य ऋक्० महादेवभ ट पुत्रानंतभटस्य वृतिरेका ११ जामदग्न्य गोत्रस्य ऋक् ० केशवभट पुत्रानंतभटस्य वृ तिरेका १२ आत्रेय गोत्रस्य ऋक् ० गोविंदभट पुत्र जनार्दनभटस्य वृतिरेका १३ जामदग्न्य गोत्रस्य ऋक् ० रामकृष्ण पुत्र विष्णुभटस्य वृतिरेका १४ आत्रेय गो त्रस्य ऋक् ० दामोदरभट पुत्र हरीभटस्य वृतिरेका १५ कौशिक गोत्रस्य ऋक् ० मांदे शी पुत्र गोविंदभटस्य वृतिरेका १६ जामदग्न्य गोत्रस्य ऋक् ० विठलभट पुत्र वा सुदेवभटस्य वृतिरेका १७ कौशिक गोत्रस्य ऋक् ० गोवींदभट पुत्रस्य पौम्निदेवभटस्य वृतिरेका १८ जामदग्न्य वत्सगोत्रस्य ऋक् ० हरीभट पुत्र महादेव भटस्य वृतिरेका १९ वासीष्ट गोत्रस्य ऋक् ० नारायणभटपुत्र तानभटस्य वृतिरेका २० जामदग्न्यव त्स गात्रस्य ऋक् ० महादेवभटपुत्र भटंभटस्य वृतिरेका २१ भारद्वाज गोत्रस्य ऋक् ० नामदेव भट पुत्र विठलभटस्य वृतिरेका २२ भारद्वाजगोत्रस्य ऋक् ० दामदेवभट पुत्र माहादेवभटस्य वृतिरेका २३ वासीष्ट गोत्रस्य ऋक् ० गोवीदभट पुत्र केशवभटस्य वृ तिरेका २४ भारद्वाज गोत्रस्य ऋक् ० अनंतभट पुत्र दामोदरभटस्य पुनर्महाजनैः अन्यादत्ता वृतिरेका २५ एवं पंचविंशति वृतयाः कुचरीनामधेयस्येदानीं कृत माधव पुराभिधंतस्या ग्रहारस्य चतुः सीमाविवरणं ॥ पुर्वस्यां दिशी पाटग्रामस्य सी म्नो पर्वत शिरसि वटवृक्ष पाषाणः ॥ दक्षिणस्यां दिशी म्हापण ग्रामस्य सीम्नि अरे णमध्यतपर गालीती क्षारीक्षेत्रां तर्गतं कृत्वातत्प्रभृति पश्चिम दिगनुखारीप्रकारं समीपतः समुद्रवेलायां ह्रदश्च ॥ पश्चीमस्यां दिशी समुद्रः ॥ उतरस्या दिशी परौ ल्य ग्रामस्यसीम्नि प्रवाहादधः समुद्रपर्यंतौ क्षारोदकनदीच ॥ एवं चतुः सीमात र्गतं माधवपुरा ग्रहारं सहिरंण्योदकदानधारापुर्वकं सर्व नमस्यं सर्वबाधा विव र्जितं नीधो निक्षेप जल पाषाण सिद्धिसहितं चतुर्विंशति ब्राम्हणाः सुखेन भुंजी रन् ॥ सामान्योयं धर्मसेतुर्नृपाणां काले काले पाले पालनीयो भवद्भीः सर्वाने तान् भाविनः पार्थिवेद्रान्भूयो भुयो याचते रामंचंद्राः स्वदतां परदतां वायो हरेत वसुन्धराम् ॥ षष्टीवर्ष सहस्राणी विष्टांया जायतेकृमीः॥ श्री शुभमस्तु॥

ART. V.—*A Comparative Vocabulary of the Non-Sanscrit Vocables of the Vernacular Languages of India.* By the Rev. J. STEVENSON, D. D.

Presented December 11th 1851.

PART I.

Philology and Ethnology are two branches of knowledge, which, though seemingly independent, are yet intimately connected, and throw mutual light on one another. No sojourner in India can have paid any attention to the physiognomy of the higher and lower orders of natives without being struck with the remarkable difference that exists in the shape of the head, the build of the body, and the colour of the skin, between the higher and lower castes, into which the Hindú population is divided. The high forehead, the stout build, and the light copper colour of the Brahmans, and other castes allied to them, appear in strong contrast with the somewhat low and wide heads, slight make, and dark bronze of the low castes. Every one feels, on contemplating these characteristic marks, that he has been brought in contact with two distinct races of the human family. It is usually found that difference of language characterizes difference of race, and therefore in the present instance we should expect a difference in the speech of these two classes of the inhabitants of India. In all nations, even where the higher and lower orders are of the same race, such differences do indeed exist, as in England; and, on the other hand, where the races are totally distinct, as in the West Indies, the same language is usually spoken by both; yet in the last mentioned instance there are usually to be found traces of the ancient tongue of the subject people, mingled with the newly-adopted language of their masters. It is this ancient language of the subject race in India that we are endeavouring to trace through the different spoken dialects, by means of this Comparative Vocabulary.

The spoken languages of all the nations of India Proper, including Ceylon and the adjacent islands, are mixtures in various proportions of the Sanscrit, the original language of the Brahmans, and another language of a different family, of which we find the most copious remains in the dialects of the hill tribes, and in the Canarese and Tamil languages. There has indeed been introduced, in later times, a multitude of terms of Arabic and Persian origin by the Mahomedan conquerors of India, relating to government, law, and new phases of civilization, which now enter more or less into all the vernacular tongues. The interest of this part of the Indian languages to the philologist and ethnologist is not however so great as to induce us to enter upon it, nor does it present any difficulties to any one moderately versed in Urdú. The same remark also applies in a great measure to the Sanscrit element in the Indian languages. I was rather surprised at first, when examining the Bengáli, Támil, Malayálim, and Singhalese dictionaries, to find one half of them occupied with the explanation of the very same Sanscrit words with which I was already familiar from meeting them in the Hindí, Maráthi, Gujaráthi, and other allied tongues. After collecting materials to some extent for a comparative list of Sanscrit derivations in the different vernaculars, I abandoned the work from the perception that in the almost perfect sameness of the adopted words there was nothing to compare, except a few terminations and euphonic changes, which ten words could illustrate as well as ten thousand. I found that as in the Italian, Portuguese, Spanish, French, and English, the Latin element common to all is derived from the Roman language in a peculiar stage of its development, so it was with the Indian vernaculars in reference to the Sanscrit. I may illustrate my meaning thus: the term for *a water-spring* is not derived in the European vernacular tongues directly from *fons*, but through the mediæval *fontana*, a word now found in the Italian, giving rise to the French *fontaine*, and English *fountain;* and in the same way *certain* comes from *certus*, following with many other words a form which first in the decline of classic literature showed itself in proper names, as Domitianus from Domitius, and Justinianus from Justus, and then, from a fancied superiority of sound, was forced upon common substantives and adjectives. The Sanscrit of the Indian vernacular tongues also is the Sanscrit of a certain age—of an age when the language had been brought out of the simplicity and barbarism of the Vedic period nearly into the state that it exists in the classic literature of the Brahmans. What is most singular is that in the language of Ceylon

these words are the same as in the languages of continental India. In Ceylon the Sanscrit element undoubtedly owes its origin to the Pali introduced by the Buddhist priesthood; nor is this Pali anything but a modified Sanscrit, differing not more from the Brahmanical tongue than the present Romaic from classic Greek. According to the most accurate researches of Mr. Turnour, as corrected by himself, Buddhism was introduced into Ceylon about the commencement of our era. We have little reason to believe that with the exception of the Vedic hymns, any portion of the Brahmanical literature extends beyond that period, but on the contrary, that much of it was composed after the decline of Buddhism. However this may be, the Sanscrit language since the beginning of our era can have undergone no important variations. It ceased before that period generally to be a spoken language, and was thus removed from the influence of the usual sources of change. The encouragement given by the Buddhists to the vernacular tongues tended to throw it a good deal into the shade, and left its cultivation to the more rigid ritualists. There is one change, however, which the Sanscrit has undergone, which we must notice, as it bears particularly on the subject we have in hand: it is the introduction into it of words from the vernacular languages of India. The question is, What words are Sanscrit?—Is every word found in a Sanscrit book or dictionary radically Sanscrit? This is a question of no easy solution. If on the one side we are obliged to take every word any Brahman has used in writing Sanscrit as belonging strictly to that tongue, then we must canonize as classical Latin all the Gallicisms and Germanisms of the writers of the middle ages. On the other hand, if we reject any portion, there is danger of our reasoning in a circle, and setting up our own fancies as the standard of truth. If we may reject what we like, and retain what we like, our conclusions become useless for any philological or ethnological purposes.

It is then a principle of language that the same men do not invent numerous terms to express the same idea. Ask any one acquainted with Latin what word in that tongue stands for *water*, he will without the least hesitation answer *aqua;* and if the corresponding Greek is demanded he will reply ὕδωρ; if the Persian, آب (âb); if the Hindustani, पानी (páni); if Bengáli, जल (jöl); if Canarese, नीर (nîru); and so on in reference to other languages, giving only one word. True, in English we might use *fluid*, or *liquid*, instead of *water*, and *aqueous fluid* would be an exact counterpart expression; but every one at a glance perceives that these are either epithets, or derivatives from ano-

ther language. *Aqua vitæ, alcohol, spirits, barley bree,* are all used to denote the same liquid, but one of these words is taken from the Latin, another from the Arabic, and a third from the Scotch, and there is but one pure English term among the four. It is thus we judge of the numerous words used in the Arabic and Sanscrit to express the same idea; they are either mere epithets, or foreign or provincial words, adopted into the language. The Brahmans scattered through all the different provinces of Hindostan must have learned the languages of the tribes to whom they acted the part of astrologers and spiritual guides, and no doubt adopted many of the words of the languages of the tribes among whom they resided, and introduced them into the sacred tongue. In accordance with these principles, then, we would, if asked what was the old and radical Sanscrit word for water, say it was आपः (âpa*h*). जल (Jala) is an old Indian word used as the chief provincial term in Bengal, Orissa, and Ceylon to this day, to denote the substance in question. नीर (Nîra) is Canarese, and pervades most of the languages of the South as well as that of the Todas, the primitive inhabitants of the Nilgherry Hills. उदक (Udaka) means strictly only a liquid; thus the author of the commentary on the Kalpa Sutra, in mentioning what things were most remarkable in their class, cites nectar as chief among liquids, उदकेषु अमृतं. Again सलिलं from its derivation, may be rendered a fluid. Try in the same way to derive the three first mentioned words from any radical ideal: आपः we are told comes from आप, to obtain, जल from जल, to hide or encompass, and नीर from नी, to obtain. The Brahmans ought to be ashamed of such absurdities. If the idea of water is to be derived from hiding or obtaining, we need no more stickle about the stories contained in the Purans. Such derivations and such transformations are equally probable. These are primitive words, and cannot be derived from verbal roots; and all except the first must have been introduced into the language by provincial writers, and then adopted by lexicographers.

In the present state of philological inquiries in India, however, I shall not be able to derive much advantage from the principle here laid down. Thoroughly convinced of its soundness as I am, if I were to make much use of it, it might seem as if it were introduced merely to serve a purpose. I shall not omit Sanscrit words that I decidedly think borrowed from the vernaculars, but the Sanscrit will also in these instances be given, and the reader left to form his own judgment. In reference to the Sanscrit portion of the vernacular languages of India, it is a singular fact that it is purer among the inhabitants of Malabar and

Mysore than among those of Bengal and Upper India. The reason of this can be easily given, though it be not at first obvious. In Upper India, Bengal, and Gujarath, nine-tenths of the language is a corrupted Sanscrit. The Brahmans and higher classes there more easily fall into the prevailing pronunciation of Sanscrit words, whereas in the South the Sanscrit vocables, being rarely used by any except Brahmans or well-educated persons, the primitive forms, though with the notable exception of the dropping of the proper marks of the genders of nouns, have been more carefully preserved. We may notice also that the Bengáli and Maráthi are strongly inclined to the use of the long *á* (आ) instead of the short (अ). They are the Doric dialects of India. The Singhalese has almost as much Sanscrit as the Hindustani, more at least considerably than the Támil and Canarese, confirming the tradition that derives the Buddhist colony from Orissa. These two last mentioned tongues retain most of what I deem the speech of the aboriginal Indians.

In reference to the order in which the following vocables are arranged, I have put the Canarese first, as containing the greatest number of words not Sanscrit, if I may judge from the dictionary which I have, viz. Garrett's Abridgement of Reeves. For the Támil words I use Rottler, for the Singhalese Clough, the Malayálim Bailey, the Bengáli Ram Comal Sen, the Maráthi Molesworth, the Gujaráthi Nowrojee Furdoonjee, the Hindí Thompson and Taylor, the Telinga Campbell, the Oriya Sutton, the Sindhí Stack. The last two and the Bengáli are English and Indian, the others have the words in the Indian tongue arranged alphabetically, as in Wilson's Sanscrit dictionary, of which I use the second, and of the other works the first editions. For the harsh *r* of the Southern languages I use in Devanagari ऋ, in English *rr*; for the last letter in the word Támil in Devanagari ळ, in English *zh*. The Canarese, Telinga, and Maráthi languages often require ज to be pronounced, not *j*, but *z*, or *dz*, and the Támil and Malayálim have a peculiar *n*. There are rules for these, however, which those acquainted with those languages know how to apply, and I have not thought it needful to mark these changes of sound. The peculiar vowel of the Singhalese I have written अय and *æ*.

Before proceeding to the catalogue of aboriginal words we may exhibit a specimen of the transformations the Sanscrit undergoes when adopted into the vernacular tongues. Besides the forms here given, it is not unusual to meet with the pure Sanscrit word as well as the corruption in some of the dialects. The pure word will be heard from

the mouth of Brahmans, or be found written in the higher orders of compositions, while the corrupted form will be that used by the common people.

It is no uncommon thing, also, for the pure word to occur in certain senses, and the corrupted in certain others, thus enriching the language. For example कर्म is a word that applies in some of the vernaculars to religious, or irreligious acts, while its corruption, काम, means any common work or employment; in the same way as *rite*, in English, is "the prescribed manner of conducting religious services," while *fashion* and *custom* are used of things trivial and common.

Corruptions of Sanscrit Words in the Vernacular Languages.

Sanscrit.	Páli and Magadhi.	Hindi.	Sindhi.	Gujaráthi.	Maráthi.	Bengáli.	Uriya.	Singhalese.	Telinga.	Canaresc.	Malayálim.	Támil.	Miscellaneous.	English & Latin.
अक्षि akshi	अखि akhi	आख ákh	अखि akhi	आख ákh	अक्षि akshi	....	अखि akhi	अक aka	....	अक्कि akki	अक्षम् aksham	अकि aki	*Punjábi*, ákh	the eye, oculus
कर्म्म karmma	कम्म kamma	काम kám	कमु kamu	काम kám	काम kám	कर्म्म karmma	कर्म karm	करण karana	कर्ममु karmamu	कर्म karma	कर्म्मम् karmmam	करुमम् karumam	*Tibetan*, karma	an act, actus
एक eka	एक ek	एक ek	हिकु hiku	एक ok	येक yek	एक ek	एक ek	एक्क ekka	ओक oka	एकम् ekam	एकम् ekam	एगम् egam	*Persian*, yak یک	one, unus
द्वि, द्वय dvi or dvaya	दुवे duve	दो do	ब ba	बे be	दोन don	दुइ dui	दुइ dui	देकयि dekayi	द्विकमु dvikamu	द्वयि dvayi	द्विकम् dviknm	तुवि tuvi	*Latin*, duo *English*, two *Cashmerian*, zuh	two, duo
षष shush	छ chha	छ chha	छ chha	छ chha	साहा sáhá	छय chhaya	....	हययि hayayi	षटमु shatamu	षट् shat	षट् shat	सडु sadu	*Latin*, sex *English* six *Cashmerian*, sheh	six, sex
हस्तिन hastin	हत्थि hatthi	हाथी háthi	हाथी háthi	हाथी háthi	हत्ती hatti	हाती hátí	हाती hátí	अयतु ætu	हस्ति hasti	.. ....	हस्ति hasti	अत्ती atti		elephant, elephas

N. B.—It is particularly to be noticed that with a few trivial exceptions the words given in the first nine columns are those of most common use for the idea expressed, while in the last four the words given are uncommon, and only employed in composition, or used by Brahmans.

A COMPARATIVE

Of the Non-Sanscrit Primitives of the chief

No.	CANARESE.	TA'MIL.	MALAYA'LIM.	TELINGA.
1	आ á That, *Illud*	अ, अव a, av That, *Illud*	आ á That, *Illud*	आ अ á a That, *Illud*
2	अकटविकट Akaṭavikaṭa Confused Involutus	अगडु Agaḍu Deceit Fraus	....	अकटविकटमु Akaṭavikaṭamu Topsy turvy Reversus
3	अक्क Akka An elder sister Soror major natu	अक्कै Akkai An elder sister Soror major natu	....	अक्क Akka An elder sister Soror major natu
4	अक्कर, अक्कर्ति Akkara, akkarti Love Amor	अगडु Agaḍu The inside Pars interna	अकतार् Akatár The heart Mens	अक्कु, अकटिक Akku, akatika The breast, mercy Pectus, misericordi
5	अक्कु, आगु Akku, águ To be, to become Esse, fieri	आग्रदु A'gradu To be, to become Esse, fieri	अकुन्नु Akunnu To be, to become Esse, fieri	अवु Avu To become Fieri
6	आकळु A'kaḷu A cow Vacca	कर्रवै Karravai A milch cow Vacca lactaria	कर्रप्पि—कुन्नु Karrappi kunnu To give milk Lac præbere	कळ्ळि Kaḷḷi The milk bush Euphorbia tirucalli

No. 1.—The long and short vowels being frequently interchanged, the words will in this Vocubulary be usually found arranged according to the sound, without considering the length of the vowel, though care has been taken not to confound the two together in writing. Instead of अव in the Tamil, अ only is written before a consonant, but the consonant is doubled. To this list might be added the Scindian and Tibetan हो, the Bengáli ओ, the Turkish او, Persian ان, Slavonian *on*, Burmese *ho*; and from the hill tribes the Dhimal *u*, and Garo *ou*. In writing the Hindustáni and Maráthi in English characters, *w* is sometimes used as the substitute of व, when that suits the pronunciation much better.

No. 2.—The Latin terms are not here or elsewhere always exact synonymes, but sometimes further explain the idea given partially in the English. The root here is probably the Canarese interjection of surprise, अकट, *akata*.

No. 3.—The Sanscrit अक्का means *a mother*. It is an uncommon word, and probably taken from the Maráthi अक्का, which, especially when coupled with बायी, or बाई, the cor-

VOCABULARY

Vernacular Languages of India.

SINGHALESE.	MARA'THI'.	GUJARA'THI'.	HINDI'.
अर् ऊ Ar ú That, *Illud*	हा Há This, *Iste*	आ á This, *Istud*	वो Wó That, *Illud*
अकटविकट Akaṭavikaṭa Foolish pranks Tripudia	अकटविकट Akaṭvikaṭ Disorderly Indigestus	....	....
अक्का Akká An elder sister Soror major natu	अका Aká Elder sister O soror major natu	....	....
अरटुव Araṭuva The heart Pars interna	आवड A'waḍ Love Desiderium	....	....
....	आव A'va Show, power Pompa, vis	....	....
कलकुमडव Kalkumaḍva A herd, a company Agmen	कळप Kaḷap A herd, a flock Boum, &c. agmen	....	S कलाप Kaláp An assemblage Conventus

ruption of भार्या, means any elderly female. The Toda of the Neilgherries is *okena*, and the Tulu of the Malabar Coast *akke*, and the Tungusian, according to Klaproth, *oki*, for an elder sister. Among the Assamese tribes the Bhotia is *azhim*, the Changlo *ano*, the Garo *abi*, and the Keshári *anobai*. The Tamil is no doubt also connected with the Tibetan *achke*, and a truly aboriginal word.

No. 4.—This word has many words allied to it in the Southern tongues, but I cannot trace it in the Northern family further than the Maráthi.

No. 5.—The remark made on the last word is even more applicable to this.

No. 6.—The Hindi word here given is pure Sanscrit. The trace of connection with the Southern family commences in the Maráthi. The word in Hindi and Sanscrit applies to other kinds of collections, but never to those of cattle, where यूथ, or a corruption of it, is generally used. It would seem, then, that the Maráthas have adopted and corrupted the Sanscrit word, giving it also a new sense, derived partly from the ancient Indian, and partly from the Brahmanical tongue.

No.	CANARESE.	TA'MIL.	MALAYA'LIM.	TELINGA.
7	अगचु Agachu To press down Comprimere	कसङ्ग्राडु Kasanggu-grradu To be squeezed compremi	....	गचुपिचगु Gachchupichchagu To be disordered Inconditum esse
	अगडु Agadu Fierce, untamed Ferox	अगडि Agadi A deceiver Fraudulentus	....	अगडु Agadu An accusation Criminatio
8	अगल Agala Broad Latum	अगलम् Agalum Breadth Latitudo	अकलम् Akalam Breadth Latitudo	अगलु Agalu To burst asunder Rumpere
9	अगलु, अगळि Agalu, agali To dig, a trench Fodere, fossa	अगऴि ; अगिळ् Agazhi, agil A fort trench Arcis fossa	....	अगडु Agadu A trench, a moat Fossa
10	अज्ज Ajja Grandfather Avus	अतन् Atan Father Pater	अच्छन Achchhan Father Pater	अव्व Avva A grandmother Avia
11	अञ्चे Anche A relay, the post Statio, veredorum statio	असै-दल Asaidal Motion, walking Ambulatio	अञ्चल् Anchal The post Cursores publici	अञ्चे Anche A relay, the post Statio, tabellarius

N. B. The Hindi अकडना, *to be cramped or shrivelled up, to strut*, &c.; the Canarese अक्कुलिसु, *to contract, as the muscles of the stomach, from hunger*, and all the allied words in the other languages, are derived, it is conceived, from अकर्षण, *pulling, drawing*, &c., and are therefore here omitted. It is possible, indeed, that they may have had an independent origin in the ancient Indian vernacular tongue, but at any rate they are too closely allied in form and sense with the Sanscrit to find a place in this Vocabulary.

No. 8.—The Maráthi अगदी may I think be derived from the Canarese word for broad. It is a very common word, with a negative for *by no means*, and some have mistaken this for the meaning of the simple word. The Tamil of this No. is marked as if it were Sanscrit, whether supposed to be derived from अगाध, or from what other word I can only conjecture. There is no probability in such a derivation; ध cannot pass into ळ.

No. 9.—The Maráthi term here forms a curious instance of the meeting of the two dialectic waves. अगळ, as used for *a bar*, is a corruption of the Sanscrit अर्गल, but as used for *a small pit*, a meaning quite unknown to the Sanscrit, comes from the Canarese अगळु, *to dig*. But see further on this point in No. 22.

SINGHALESE.	MARA'THI'.	GUJARA'THI'.	HINDI'.
.....	मचका, गच	गच	गचपच
.....	Gachka, gach	Gach	Gachpach
.....	A jolt, tightly	Tightly	Stuffed together
.....	Concussio, strictim	Arctè	Compressum
.....	अगडबगड	अगडबगड	अगडबगड
.....	Agaḍbagaḍ	Agaḍbagaḍ	Agaḍbagaḍ
.....	Jabber, trifles	Trash, trifling	Jabber, trifles
.....	Garrulitas	Nugæ	Nugæ
.....	अगदी	.....	.....
.....	Agadi	.....	.....
.....	In all its extent	.....	.....
.....	Prorsus.	.....	.....
अगल	अगळ,	.....	.....
Agala	Agaḷ	.....	.....
A ditch, a trench	The little pit at marbles, &c.	.....	.....
Fossa	Puteolus	.....	.....
आता	आजा	.....	आजा
A'tá	A'dzá	.....	A'já
A paternal grandfather	A grandfather	.....	A paternal grandfather
Avus paternus	Avus paternus	.....	Avus
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

N. B. Probably अङ्डे. *a shop*, is a corruption of अङ्न ; and अचवडे, *assessment on land*, is from *Sans.* अक्षत. *dry grain* ; and many of the following words from *Sans.* अच्छ *pure*, whence also the Hindi अच्छा *good.* अचु is a corruption of अक्ष, *a mould, an axle-tree*, and has the same meaning, and probably, when used as a verb in the same sense, *paying unjustly, suffering loss*, &c. it is from the same word in the sense of *a die for playing with at dice.* The words for *types, printing*, &c. in the Southern tongues come chiefly from अक्ष, as in the Northern—they are probably derived from चप, *to pound*, giving us छाप &c.

No. 10.—The Burmese अचे *(atse), an ancestor of the seventh degree upwards*, may here be added.

No. 11.—Probably the Sanscrit roots अच and अञ्च. have received the sense of *to go* from the Tamil, the root, which is properly अञ्च. In the Tamil we have a large number of derivative words from this root, but I have not found one in the Sanscrit. The compilers of the Dhatu-manjari then, I feel confident, have in this instance, as in many others, given meanings to the roots which they have not in the pure Sanscrit.

No.	CANARESE.	TA'MIL.	MALAYA'LIM.	TELINGA.
12	अञ्चु Anchu To fear Timere	अचम, अञ्जल् Acham, anjal Fear Timor	अचम् Achcham Fear Metus	अञ्चेना Anchena An estimate Census
13	अटकु, अटतटि Ataku, atatati Hinderance, obstacle Impedimentum	अटि Ati Delay, hinderance Mora, impedimentum	अटेप्प Ateppa Obstacle Impedimentum	अटकावु Atakávu Prevention Obstructio
14	अडसट्टु Adasattu A conjecture Ariolatio	अडङ्गल Adanggala A contract for work Pactio	अटङ्कल् Atangkal An estimate Æstimatio	अट Ata It is reported Aiunt
15	अट्टु Attu To abate, to be boiled dry Desiccari	अडङ्ग-क्राटु Adang-krradu To abate, to sink down Diminui, residere	अटङ्ङुन्नु Atangngunnu To be humbled, to abate Deprimi, reprimi	अडङ्गु Adanggu To be depressed Deprimi
16	अठवणे Athavane Remembrance Recordatio	....	अटयालम् Atayálam A sign, a token Signum, nota	अडियालमु Adiyúlamu A sign, a token Signum, nota
17	अडगु Adagu To be hidden Abdi, lateri	अडकम् Adakam Concealing, sepulture Occultatio, sepultura	अटक्कि-कुन्नु Atakkik-kunnu To cover, to conceal Tegere, celare	अड्डु Addu That which conceals, a cover Celator, tegmen
18	अडयु : अड्ड- Adayu, adda- To have, bye- Habere, sub-	अडै-ग्रदु Adai-grradu To have, to be near Habere, propinquum esse	अटुत्त Atutta Near, belonging to proximè, illi pertinens	....

No. 12.—But for the Telinga, which joins the form of the Southern family with the meaning of the Northern, which have derived the word from the Persian آزمایش I should not have ventured to trace here any connection. Yet as آزآیش is also used in Persian, the Tamil and Persian roots are to all intents the same, and the radical ideas of trying and fearing are not irreconcileable.

No. 13.—The meaning in all the languages except the Singhalese is indentical. The word अटक, or अटकाव in this sense is to be found also in the Panjábi, Scindian, Uriya and Bengáli languages. This root must be carefully distinguished from the Sanscrit root अट, *to move, surpass*, &c., whence अट्ट *an upper room or attic*, and some other words, which also enter into the vernacular languages, are derived. It is also to be distinguished from the next No., the root of which is in the Telinga a verbal particle अट, *it is reported*, and therefore I have, for the connection, brought forward the Canarese word out of its

SINGHALESE.	MARA'THI'.	GUJARA'THI'.	HINDI.
.....	अजमास	अजमाएश	P अजमाईश
.....	Adzamás	Azmáesh	Azmáish
.....	Estimate, conjecture	Trial	Trial, proof
.....	Æstimatio	Experimentum	Probatio
अट्टुव	अट, अटक	अटक, अटकाव	अटक, अटकाव
Aṭṭuva	Aṭ, aṭak	Aṭak, aṭakáva	Aṭak, aṭákava
A glutinous substance	Obstruction, hinderance	Obstruction	Stop, hinderance
Aliquid glutinosum	Impedimentum	Impedimentum	Cessatio, obstructio
.....	अटकळ	अटकलो	अटकल
.....	Aṭakaḷ	Aṭakalo	Aṭakal
.....	Conjecture, guess	Conjecture	Conjecture, estimate
.....	Conjectatio	Ariolatio	Conjectatio
अडुवेनवा	अटणे	.....	.....
Aḍuvenavá	Aṭne	.....	.....
To decrease	To be dried up	.....	.....
Diminui	Desiccari	.....	.....
अडयालम	अठवण	.....	.....
Aḍayálama	Aṭhavaṇ	.....	.....
A brand, a mark	Remembrance	.....	.....
Nota, signum	Recordatio	.....	.....
अडय	आड	आड	आड
Aḍaya	A'ḍ	A'ḍ	A'ḍ
A prop, a stopper	A well, shelter, cover, protection	Protection, shelter	Shelter, concealment
Adminiculum, obturamentum	Puteus, munimen	Munimen, refugium	Asylum, abditum
अडुत्तु	अड—*In composition*	आड—*In comp.*	.....
Aḍuttu	Aḍ-	A'ḍ-	.....
Belonging to	Bye-, spare	Less	.....
Alicui pertinens	Sub-, extra	Minor	.....

place. The Telinga word, however, is derived from अण, *to speak*, and in the Dhatumanjari we have the meaning *to sound* given to this root, though not one of the Sanscrit derivatives has any connection with sound. Here again I suspect the author to have had the vernaculars in his eye.

No. 15.—Here the Hindi अटना follows entirely the Sanscrit sense of the root, and means *to be filled up*, a sense also found in some of the other tongues occasionally.

No. 17.—This is one of the instances that beautifully illustrate the necessity of studying the Southern languages to be able to see the derivation and full force of the words in the Northern. The same root appears also in the Panjábi अड्तला (aḍtalá) *shelter*, which is also Hindi, the Scindian अड (aḍ), and the Bengáli आडाल (àḍàla) in the same sense.

No. 18.—The अड here, in some of the languages, corresponds to the उप of the Sanscrit, which in others has taken its place.

No.	CANARESE.	TA'MIL.	MALAYA'LIM.	TELINGA.
19	अडवु, Aḍavu A deposit, a pawn Pignus	अडगु. Aḍagu A pawn, a pledge Pignus	अटमानम् Aṭamánam A pledge Pignus	अड्डी, Aḍḍí A deposit Depositum
20	अडलु, Aḍalu To tremble, to fear Tremere, pavere	अडि Aḍi A stroke, a blow Ictus	अटि, Aṭi A blow, a stripe Ictus, plaga	अडलु. Aḍalu Fear, terror Timor, pavor
21	अडि, Aḍi A foot, the bottom Pes, solum	अडि, Aḍi The foot, foundation Pes, fundamentum	अटि, Aṭi The foot, a footstep Pes, vestigium	अडुगु, Aḍugu A foot, a footstep Pes, vestigium
22	अड्ड, Aḍḍa Anything in a cross direction Ecquid transversum	अटम्, अटनै Aṭam, aṭanai Across Transversè	अटुक्क, Aṭukka A row, a layer Series	अड्डम. Aḍḍamu Anything transverse Ecquid transversum

No. 20.—The Hindi डर here is probably derived from the Sanscrit द्र. The Southern influence then is confined to the change of द to ड.

No. 21.—This number also traces an uncommon word in the Northern tongues to its source in the Southern. The Bengáli is the same as the Hindi, and the Scindian has अडि for *spurring*.

No. 22.—This is a truly aboriginal root, which runs through most of the Indian Vernaculars. The Scindian has for *transverse* आडो (áḍo), the Bengáli एडो (eḍo), the Uriya आड (aḍa).

N. B. I am not quite sure of the Malayálim here, but as the Canarese अड्ड चौक *(adda-chouka) oblong*, is probably from this root, I think it should be admitted. What if the Sanscrit अर्गल *(argala)* a wooden bolt, of which no even plausible derivation can be given from Sanscrit roots, be a mere corruption of the Canarese अड्डकोलु, (aḍḍakolu)

SINGHALESE.	MARA'THI'.	GUJARA'THI'.	HINDI'.
.....	अडत,	आडत,	अडहत,
.....	Aḍat	A'ḍat	Aḍhat
.....	Mercantile agency	Agency, brokerage	Agency, commission
.....	Negotiorum procuratio	Procuratio	Procuratio
.....	डरकणे,	डर,	डर,
.....	Ḍarkaṇe	Ḍar	Ḍar
.....	To roar, to rave	Fear, dread	Fear
.....	Rugire, insanire	Timor, pavor	Timor
अडिय,	एड,	एडो, एड	एडि, एड
Aḍiya	Eḍ	Eḍí, Eḍ	Eḍi, Eḍ
A foot, bottom	A spurring with the heel	The heel, spurring	The heel, spurring
Pes, solum	Calce stimulare	Calx, stimulatio	Calx, calce stimulatio
हरहव,	आडवा,	आडो,	आडा,
Harahava	A'ḍava	Aḍo	Aḍá
Crosswise	Transverse, adverse	Cross, crooked	Transverse, oblique
Transversè	Transversus, adversus	Transversus, flexus	Transversus, obliquus

a cross-bar of a door, derived from अड्ड? If it should turn out that many words have been admitted into the Sanscrit which are derived from the vernacular languages of Southern India, it will account for the prevalence of words, apparently Sanscrit, used among classes of the population where Brahmanical influence has scarcely been felt. When we remember, too, that Sankar Achárya, the great champion of modern Hinduism, was born in the Canarese country, this supposition appears the less improbable. In the present instance the word कुलु in Canarese means "*that piece of wood which projects from the inner edge of the leaf of a door, fitting into a socket, and serving the purpose of hinges.*" Now, the radical idea of the word when used as a verb, as given in the dictionary, is that of falling down; and the cross-bar in question is actually let fall down into its place inside of a bent piece of wood, or iron, fixed in the door, projecting upwards, and retaining it in its place.

ART. VI.—*Note on the Rock-Inscriptions in the Island of Salsette.* By the REV. J. STEVENSON, D.D.

Presented December 1851.

THE Cave Commission having obtained, by way of experiment, from Mr. Wilson, Paris-plaster Castes of the Inscriptions found on the rocks at Salsette, four of which are in Pali and one in Sanscrit, I have been examining the Pali ones, and here give the following transcript in Devanágari, and attempt at translation of two of them. They seem to contain nothing of peculiar interest, yet, when the whole of the Inscriptions on our rocks shall have been carefully examined, an interest may be reflected on those which seem at present wholly unimportant. For the sake, then, of future antiquarians, it is best to omit nothing, but to endeavour to render all of them generally intelligible as far as possible.

The first then is as follows* :—

सेपारेगाणगम ससमोकपसक सपोढी देयधम

Translating this into Sanscrit it will stand thus:

सेपारेगार्णागमस्य समीक्षप्रसक्तस्य तडद्यधर्मः

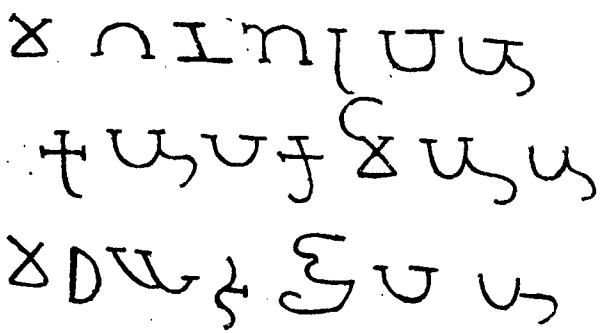
A Tank, the charitable gift of him who, devoted to Intellect, has crossed over the Waters of Affliction.

In this rendering I have translated all the words, but perhaps *Samikshaprasakta*—"Devoted to Intellect" is a proper name, and not an epithet. The word पोढी is attended with much difficulty. A word very like it in the Junír Inscriptions, copied by Colonel Sykes, by Prinsep (Journal As. Soc. Bengal, Vol VI., p. 1044) is made उढी, a word which he derives from a rare Sanscrit term उड्रः *water*. Before I noticed this, however, I had arrived at the reading I have given, and on examining the inscription anew, I found that I could not change it. Almost in despair about what to make of this word, I turned up the Maráthee Dictionary, rather to be able to feel satisfied that I could

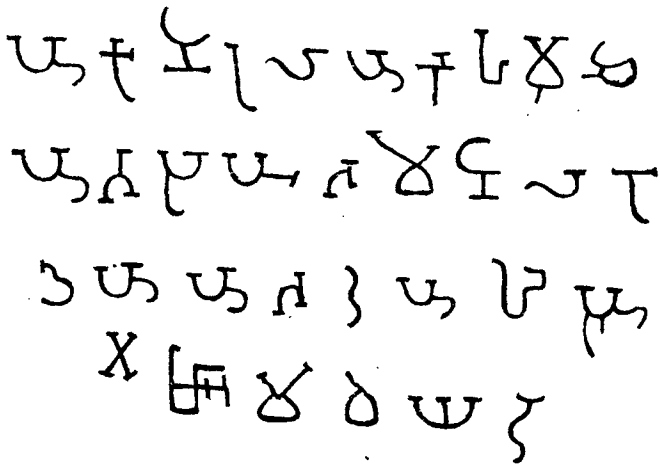
* For the Facsimile, see Pl. V. No. 1.

Fac-similes of Rock-Inscriptions in the Island of Salsette.

No. 1.



No. 2.



arrive at no satisfactory conclusion, than from any hope of finding a clue to a word I had never heard used, when I found both पोंढी and पोंढा. It is the sense given to the latter, however, that of "a receptacle for water," which suits our context, and this, I have no doubt, is the meaning of the term here, as the Inscription is over a tank.

In reference to the word देय there is no doubt of the reading, but it is interchanged with दय in other Inscriptions, so that it may be taken here as दय—"compassion," an attribute of the Buddhist religion, as it is also of the Jain, since no offering can be presented to a superior being that gives pain to any animal. The reason of such a designation is not very evident at present, but must have been striking enough when the Brahmans, following the ritual of the Vedas, were in the frequent habit of offering horses, and other animals, even the sacred cow, to their gods. I am rather of opinion still, however, that here it is to be taken in the sense of दाय, as दान, which means the same thing, is to this day often coupled with धर्म by the Maráthas, in the way that देय is here. I think we shall find as we proceed in examining these Inscriptions that we must look more to the provincial dialects of the different localities than we are often inclined to do, and less to the Sanscrit.

The second Inscription* is—

क्षेमलकस हेरणिकस रोहणिमितसपुतससु लासदतस सोटा देयधम

In Sanscrit,

क्षेम लक्षस्य हैरण्यकस्य रोहिणिमित्रस्यपुत्रस्य सुलासदत्तस्य स्वस्तिक दायधर्मः

The charitable gift of a Svastika Temple by Súlasadata, son of Rohanimita, the goldsmith, whose eye is directed to prosperity.

In this Inscription there is not much difficulty. The first word in the original, and last in the English, may be read so as to mean "who is fated to prosperity," for लक means a "forehead" in Sanscrit, but I prefer changing it into the more common word लक्ष, which the analogy of the languages does not forbid. Rohinimitra is a name of Chandra, the deified Moon. In the Concan it is customary to drop the short इ in the middle of words, and so it happens in this word. The only difficult word is सोटा, of which the reading can hardly be doubtful. I have taken it as synonymous with Svastika, a particular kind of temple. The figure Svastika, which immediately follows the Inscription, seems to indicate as much, although it is of frequent occurrence in Inscriptions, and much stress cannot be laid upon it.

* For the Facsimile, see Pl. V. No. 2.

The word *Svastika* itself implies rest and comfort of body and mind. सोट in Maráthi, among other things, means "a causeway, or paved road, made up a steep ascent." I shall have to see, by a minute personal inspection, whether the Inscription is connected with a temple, or near such a road, before I decide finally between the two.

Art. VII.—*Extracts from the Proceedings of the Society for the Year* 1850-51.

MEMBERS ELECTED.

FROM 19TH DECEMBER 1850 TO 25TH NOVEMBER 1851.

Lieut. Col. Blood. Captain M. Taylor.
A. Rimington, Esq. J. N. Rose, Esq.
Major Delhoste.

PRESENTS TO THE LIBRARY.

	Donors.
Analyse der in Anquetil Duperron's uebersetzung enthaltenen Upanishad, (from Weber's "Indische Studien")	Professor Weber.
Bahlol (Munshi), Geographical Description of the Panjab, in Panjabi, translated from the Persian	Sir H. M. Elliot, K. C. B.
Beke (C. F.), Enquiry into M. Antoine D'Abbadie's Journey to Kaffa, to discover the Source of the Nile	The Author.
———Reasons for returning the Gold Medal of the Geographical Society of France, and for withdrawing from its Membership, in a letter to M. De la Roquette	———
Budhivardhak Hindu Sabha, in Guzerati	Gungadass Kessendass.
Cassels (W. R.), Eidolon, or the Course of a Soul, and other Poems	C. Peel, Esq.
Cassim (Meer Abdool), Hoodee-kat-ool Aulum (The Garden of the World)	Seraj-ool-Moolk.
Cassin (H.), Official, Descriptive, and Illustrated Catalogue of the Grand Exhibition, Parts I. to IV	The Author.

	DONORS.
CHRONOLOGICAL TABLES, containing Corresponding Dates of the different Eras used in the Bombay Presidency.....	Govt. of Bombay.
CHURCH MISSIONARY RECORD, No. II., for 1850, and Nos. II. V. VI. IX. X. for 1851.....	Rev. C. Isenberg.
CIRCULAR ORDERS of the Sudder Dewanee Adawlut.....	Govt. of Bombay.
DALZELL (N. A.), Contributions to the Botany of Western India, contained in Hooker's Journal of Botany and Kew Garden Miscellany, Nos. 13, 15, 16, and 18 to 32, inclusive.....	The Author.
———(P. M.), Monthly Statements of the External Commerce of the Presidency of Bombay, from December 1850 to August 1851..	———
DICTIONNAIRE DE L'ACADEMIE FRANÇAISE, Revu, Corrigé, et Augmenté, 2 Vols.	Hon'ble J. P. Willoughby.
DIXON (Col.), Sketches of Mairwarra.....	The Author.
DYER (G.), History of the University and Colleges of Cambridge	Hon'ble J. P. Willoughby.
GOVINDJI NARAYN, Domestic Reform among the Hindus. Evils of Debt. Treatise on Cleanliness. In Maráthi.....	The Author.
GRAMMAR of the Panjabi Language	Sir H. M. Elliot, K. C. B.
JOURNAL of the Indian Archipelago and Eastern Asia, Nos. 9 to 12 of Vol. VI. for 1850, and Nos. 1 to 8 of Vol. V. 1851.....	The Editors.
———Nos. 9 to 12 of Vol. IV. for 1850, and Nos. 1 to 4, 6 and 8 for 1851	Govt. of Bombay.
KHALID (U. F. M.), The Soorah, a Dictionary of Arabic Words explained in Persian	J. S. Law, Esq.
MACKAY (C. F.), Western World, or Travels in the United States in 1846-47.....	The Author.
MAP of Cutchee and the North Western Frontier of Sindh, including the Murree and Boogtee Hills	Hon'ble J. P. Willoughby.
MAP of Borneo.....	Govt. of Bombay.
MCCLELLAND (J.), Report of the Geological Survey of India for the Season of 1848-49.	The Author.

	DONORS.
MOOHUMMUDAN LAW of Sale, according to the Hunefeea Code, translated by N. B. E. Baillie.....	Govt. of Bombay.
MAURY (Lieut. M. T.), Wind and Current Charts.....	The Author.
NOWROZJI FURDONJI, Tareekh-i-Zurtoshtee, or Discussion on the Era of Zurtosht, or Zoroaster, the Prophet of the Parsees.....	The Author.
OBSERVATIONS made at the Magnetical and Meteorological Observatory at Hobart Town, in Van Dieman's Land, under the Superintendence of Lieut. Col. E. Sabyne.....	Govt. of Bombay.
OBSERVATIONS made at the Magnetical and Meteorological Observatory of Bombay, for the year 1847, under the Superintendence of C. W. Montriou, Commander I. N.....	———
PERRY (Sir E., Kt.), Letter to Lord Campbell, Lord Chief Justice of England, on Reform in the Common Law, with a letter to the Government of India on the same subject.....	The Author.
PRINSEP (J.), Modification of the Sanskrit Alphabet, from 543 B. C. to 1200 A. D.	———
RADICALS of the Sanskrit Language.....	Hon'ble J. P. Willoughby.
REPORT of the Elphinstone Institution for the year 1850.....	The Principal.
REPORT of the Civil Cases determined in the Court of Sudder Dewanee Adawlut for 1848-49, compiled by A. F. Bellasis, Esq., B.C.S.	Govt. of Bombay.
———of the Bombay Engineers, for the Official Year 1848-49.....	———
———of the Board of Education, for the year 1849, No. VIII.....	———
———of the Grant Medical College, Session Fifth, 1851.....	Dr. Morehead.
———of the Dekhan Vernacular Translation Society.....	The Society.
———of Crime and Police Administration of the Zillahs subject to the Bombay Presidency...	Govt. of Bombay.

	DONORS.
RIG-VEDA-SANHITA, the Sacred Hymns of the Brahmans, together with the Commentary of Syanacharya, Vol. I., edited by Dr. Max Müller.	Hon. the Court of Directors.
SOCIETY, Royal Astronomical, Proceedings, No. 8 of Vol. X. for June 1850; Nos. 1 and 2 of Vol. XI. for 1850; Nos. 3, 4, 5, and 8 Vol. XI. for 1851.....	The Society.
——Memoirs, Vol. XIX., for 1849-1850.....	——
——American Oriental, Journal of, No. 4, Vol. I.....	——
——Ceylon Branch of Royal Asiatic, Journal of, for November 1851.....	——
——Monthly Notices of, from November 1849 to June 1850, Vol. X	——
——NATURAL PHENOMENA. Translated into Maráthi by Govindji Narayn.....	Dec. Vernac. Soc.
SYKES (Lieut. Col.), Mortality and chief Diseases of the Troops under the Madras Government, European and Native, from the years 1842 to 1846, inclusive.....	The Author.
WAENEN (C. V.), Sententi Ali Ebn Ali Talebi Arabice et Latine, annotationibus illustravit. Vol. I. 4to.....	Hon'ble J. P. Willoughby.
WEBER (Dr. A.), Indische Studien, Beitrage fur die kunde des Indischen Alterthums.....	German Oriental Society.
WIGHT (W.), Icones Plantarum Indiæ Orientalis, or Figures of Indian Plants, Part I. Vol. V.	Govt. of Bombay.
WILSON (Revd. Dr.), Idiomatical Exercises, illustrative of the Phraseology and Structure of the English and Maráthi languages.	The Author.
ZEITSCHRIFT der Deutschen Morgenlandischen Gesellschalft. Vierter Band. 1st III. and IV., Heft of 1850, and II. Heft of 1851.....	German Oriental Society.

TO THE MUSEUM.

	DONORS.
Antelope Cervicapra (male), skin of white variety.	Capt. G. G. Malet.
Bombyx Paphia, with eggs and cocoon, from Sawunt Warree.....	Major LeG. Jacob.
Birds' Skins, from the Neilgherry Hills. Genera Temnurus, Dicrurus, and Oriolus.....	Capt. Montriou.
Birds' Skins, from the Forests of Cannanore....	J. S. Law, Esq.
Boats, Native Models of, in use on the River Indus: No. 1, Jamptee; No. 2, Zoruck; No. 3, Doondee. Built in the Flotilla-yard at Kotree.....	Govt. of Bombay.
Bones, Teeth, &c., with Matrix, from a Conglomerate discovered by Dr. Wilson, about two miles from Gogha, on the road to Rajcote..	Rev. Dr. Wilson.
Bos Frontalis (male and female), skulls of	Major LeG. Jacob.
Cephelopoda, Gasteropoda, Conchifera, Echinoderma, Zoophyta, and Foraminifera, a collection of fossil remains of, from Lower Scinde.	H. J. Carter, Esq.
Coin, Silver, (one,) called *Shurree Lhuree*.....	H. B. Frere, Esq.
Crystalline Sulphur, from the Island of Ormuz..	Lt. C. G. Constable.
Encrustation, specimens of, which takes place between the tubes in the boilers of Steam-vessels plying in the Indian Ocean.....	J. Ritchie, Esq.
Eschara and Balanus, specimens of, taken from the keel of one of the Peninsular and Oriental Company's Steamers.....	———
Geological Specimens, collection of, from the Rocks of the South Concan.....	N. A. Dalzell, Esq.
Gypsum, from the Persian Gulf.....	Capt. J. Estridge.
Ibex, Horns and Skull of, killed near Kalilah Hill, in the vicinity of Bushire.....	Capt. Montriou.
Images, Heathen, (four,) sculptured in Trap, from Bajalcote and Oogurgole, in the Purutghur Talooka, and Purutkul, in the Hoogoond Talooka.....	W. E. Frere, Esq.
Lion, Lioness, and Wild Ass, skulls of, from Kattyawar.....	Capt. E. E. Malet.
Limestone, black, and white Calc-spar, from Ras Massandam.....	Lt. C.G. Constable.

	DONORS.
Marble, white, from Kattyawar.....	Capt. H. Aston.
Minerals, collection of, from the neighbourhood of Malligaum.....	Lt. A. Aytoun.
Otis Houbara, and Gallus Sonneratii, skins of...	Major LeG. Jacob.
Pholadine Tubes, casts of, from the Sandstone near Kurrachee.....	Dr. Don.
Shells, from a raised beach in the Island of Kishim.....	Lt. C.G. Constable.
Trap from Salsette, and from the Tunnel of Sattara.....	Capt. J. Estridge.
Zeolites and Calc-spar, from the Trap-rock of Baboola Tank.....	G. Buist, Esq.

ORIGINAL COMMUNICATIONS.

	COMMUNICATED BY
Bradley, (Dr. H.,) Rock-cut Caves of Aurungabad.—14*th August* 1851. *(a)*.....	General Fraser.
Carter, (H. J., Esq.,) Geographical Description of certain parts of the South-east Coast of Arabia, to which is appended a short Essay on the Comparative Geography of the whole of this Coast.—20*th March* 1851. *(b)*.....	The Author.
———Memoir on the Geology of the South-east Coast of Arabia.—9*th October* 1851. *(c)*..	———
Gibson, (Dr. A.,) Notice of a Hot Sulphureous Spring at the Lukkee Pass, and of a Saline Spring under the Fort of Kal-Droog, in the Mahim Talooka, with specimens of their waters respectively.—22*nd May* 1851. *(d)*.	———
Jacob, (Major LeG.,) Facsimiles, with Interlinear Balbodh Transcripts, and English Translations, of three Copper-plates, connected by a Ring and Seal (Buddh). The Plates are ten and a half inches broad, and half an inch thick, and were obtained from a Jain in Kharepatan, a Town on the river Viziadurg.	

(a) To appear in the General Abstract of the Cave-temple Commission.
(b) See last No. of Jl. p. 224. *(c)* This No. p. 21.
(d) See this Art. Proceed. Offic. Lit. and Sc.

	COMMUNICATED BY
The Inscriptions are dated Shak 910, equivalent to A. D. 988.—20*th March* 1851. *(a)*.	The Author.
Stevenson, (Revd. J., D.D.,) Observations on the Grammatical Structure of the Vernacular Languages of India, No. 3, The Adjective.—20*th February* 1851. *(b)*.....	———
———Ditto ditto No. 4, The Pronoun.—14*th August* 1851. *(c)*....	———
Taylor, (Captain M.,) Further Information on the Kistvaens, Cromlechs, Cairns, &c., near Ferosabad, on the Bhima, also Sketches of the Groups at Rajan Koloor, Jewarjee, and Yemmee Good.—20*th March* 1851. *(d)*..	———
Twemlow, (Col.,) Notices on certain Ancient Caves and Structural Buildings near Aurungabad.—20*th March* 1851. *(e)*.....	Govt. of Bombay.

PROCEEDINGS, OFFICIAL, LITERARY, AND SCIENTIFIC.

The Government letter No. 106, in reply to the Society's letter No. 183, dated 14th December last, respecting a further search for Cave-temples and monuments of antiquity, &c. in the territories under the Bombay Government, and the employment of an artist to illustrate those of Elephanta, authorises the Society to advertise in the *Government Gazette* the offer of rewards of from Rs. 25 to Rs. 100 for information respecting any set of Caves hitherto undescribed, the reward to be proportioned to the value and importance of the discovery; also sanctions, at the request of the Society, rewards of Rs. 100 and Rs. 20 respectively to the parties who brought to notice the Excavations of Kuda and Khondana, and those in the Garodi Hill.

The proposition for reducing the Subscription of Subscribers from Rs. 100 to Rs. 50 was then brought forward, and, after a lengthened discussion, lost, under Art. XVIII. of the Society's Regulations, which requires a majority of two-thirds of the Members present to decide any question for which they may not provide.—23*rd January* 1851.

(a) To be inserted in next No. *(b)* See last No. p. 196.
(c) This No. p. 15. *(d)* Returned at the Author's request for additions.
(e) To appear in the General Abstract of the Cave-temple Commission.

Some beautiful specimens of Calc-spar and Selenite were laid on the table, which had been obtained during the evcavation of a well in the centre of the Native town. These had been formed in the cavities of trap rock. They were sent for the inspection of the Society by Dr. Buist, accompanied by a letter, containing a section of the well from which they had been taken. Dr. Buist observes, that it would be a great help to obtaining a knowledge of the Geology of Bombay, and a great advantage to geological science generally, if the Government and the Board of Conservancy would call for geological sections of all excavations and tunnelling executed under their orders.—*20th February* 1851.

With reference to Government letter No. 966, dated 6th instant, and its accompaniments, consisting of a copy of a letter from H. B. E. Frere, Esq., Commissioner in Scinde, and one also from Captain A. B. Rathborne, forwarding a metallic cup, with silver and copper coins, dug up at Hyderabad, it was resolved that the whole should be delivered over to the Revd. Dr. Wilson, for examination.

It was moved by the Hon'ble J. P. Willoughby, President of the Society, and seconded by Major G. LeGrand Jacob, that a subscription be again opened for reprinting in England, in an 8vo. form, with the plates, on thin paper, the three volumes of the Transactions of the Society; and that the Members of the Society be invited to enter their names as subscribers for one or two copies; these volumes, better known as the "Transactions of the Literary Society of Bombay," being out of print, and in much request. The motion was carried, and the Secretary requested to act accordingly.

Dr. Wilson directed the attention of the Society to a critical edition of the whole of the Zend Writings, at present preparing by one of its Honorary Members, Professor N. L. Westergaard, of Copenhagen, who a few years ago had visited this country and Persia, for the express purpose of prosecuting Oriental research, and had gained the respect and affection of all who had an opportunity of making his acquaintance on that occasion. In forming his text, this learned gentleman, according to the prospectus issued by him, had secured the use of the Zend Manuscripts in the libraries of Copenhagen, Paris, London, and Oxford; those belonging to MM. Burnouf and Wilson, and those acquired by himself in his journeys in the East. His work is to appear in three volumes, of which the first is to contain the text of all the Zend writings; the second, a comparative Grammar of the two dialects in which it has been ascertained they are composed, and a complete Con-

cordance of the Zendavesta; and the third, a new translation in English of the Zend text. Dr. Wilson added that he considered Mr. Westergaard's researches in the Zend literature of the highest interest and importance. Mr. Westergaard, on returning his manuscripts to him, had said, "I hope that the shape of my types will meet with your approbation. They are cut according to the oldest existing manuscripts. I have promised, in the French announcement, to give a Grammar of the two dialects of the Zend language. It is not difficult to distinguish between them, especially aided by the oldest manuscripts, as the difference is very strong, and observed not only in the use of different words, or different forms of the same word, but even in the grammatical structure. As the Zend language must be referred to the Eastern parts of Iran, I hazard resting, among other facts, on the authority of Straled about the difference of the dialects of Bactriana and Sogdiana, to assign to our two dialects the names of Bactrian and Sogdian, in such a way that I should call with the name of Sogdian that dialect in which the greater part of the Yacshna is composed, as it is evidently more rude and unpolished than that of the other parts of the Zendavesta." Of the differences in the dialects here referred to, Mr. Westergaard in his communication had furnished many examples. He had also submitted to Dr. Wilson his scheme for re-adjusting the Zend alphabet, founded on a comparison of it with the Sanskrit and Greek alphabets; and had promised to notice in other letters (the substance of which Dr. W. would be happy to communicate to the Society) the general results of his researches.

With reference to the communication made by Dr. Wilson in behalf of Professor Westergaard, it was moved by the Hon'ble Mr. Willoughby, seconded by Major LeGrand Jacob, and unanimously resolved, that the Society subscribe for five copies of Mr. Westergaard's forthcoming work, in token of the interest which they feel in his important researches, and their pleasing remembrance of his visit to India.

The Revd. Dr. Stevenson, Vice-President, moved, on behalf of the Cave-temple Commission, "That the attention of the Society having often been drawn to the subject of the inscriptions engraved on the rocks and in the Caves of Western India, and more especially lately in a paper by our associate Sir Erskine Perry, the Government be applied to for the purpose of appointing an Agent to copy accurately and take impressions of all these inscriptions, under the superintendence of the Cave-temple Commission." This proposition was adopted by the Meeting.

A letter was read from Dr. Buist, containing a geological section of

a well sunk at Cochin, on the sea shore, under the directions of General Cullen. The excavations had been carried to the depth of 40 feet, and the strata passed through were successively, from above downwards,—1, ferruginous clay; 2, a variety of laterite, or new red sandstone? 3, lithomargic clay; 4, blue clay; 5, lignite; 6, sandy clay; 7, calcareous clay, or marl; 8, compact dolomite limestone, with organic remains. Dr. Buist considers this "variety of laterite" not to be a part of the laterite formation, but to be a bed of red indurated sand, corresponding to the littoral concrete of Bombay; and therefore that the lignite, copalite, &c. found next it, does not, as before supposed, lie under the laterite, but, probably, as General Cullen suggests, under "new red sandstone?"—*20th March* 1851.

A letter dated 17th March 1851 was read from Sir Henry Elliot, Secretary to the Government of India, with the Governor General, forwarding copy of one in which the Most Noble the Governor General has been pleased to direct that Dr. Flemming should be instructed to furnish a series of specimens, illustrative of the mineral resources of the Punjab, to the Asiatic Societies of Calcutta and Bombay.

The Government letter No. 1520, dated 12th ultimo, forwards the following copy of one (No. 14 of 1851) from Captain Meadows Taylor, of the Nizam's Service :—

No. 14 of 1851.

From Captain Commandant M. TAYLOR,
On special duty, Shorapoor,

To C. J. ERSKINE, Esq.,
Deputy Secretary to Government, Bombay.

Sir,—I have the honor to acknowledge the receipt of your letter of the 9th ultimo, No. 136, together with the copy of Dr. Wilson's Memoir on the Cave-temples of Western India which accompanied it.

2. I beg you to do me the favor to communicate the expression of my sincere thanks to the Right Hon'ble the Governor in Council, for his courtesy in transmitting to me this interesting memoir; and I have only to regret that there are no Cave-temples in the district under my authority to afford me the opportunity of obeying his Lordship's wishes.

3. The most curious remains I have found in this district are those which appear to be Druidical, or Scythic-Druidical, and which, whether as Cromlechs, Kistvaens, Cairns, or Barrows, have the closest resem-

blance to European Druidical remains. On this subject, I have recently written to Dr. Wilson an account of such discoveries as I have been able to make in the Shorapoor district, and included with them an account of some similar remains at a village in the Kanakagheree districts, near the Toombudra, which was visited at my request by a friend, the Revd. G. Keis, of the German Mission.

4. It is known that these remains exist in large numbers on the Neilgherries, and in regard to which a valuable and interesting paper by Captain Congreve, of the Madras Artillery, appeared in the "Madras Journal of Literature and Science," No. 32, and they have also been noticed in some parts of Mysore. I have no knowledge of their extending northwards further than the Bheema in this district; but as they extend to the Toombudra to the South, it is desirable, perhaps, to endeavour to trace them further, and I would recommend that the Collectors of Dharwar, Belgaum, and Sholapoor, the Officers of the Revenue Survey, if any, in those districts, the Political Agent in the Southern Mahratta Country, and the Commissioner of Sattara, be requested to institute inquiries as to the existence of any similar remains in their several jurisdictions, and to examine their contents.

5. I will not enter upon a detailed description of these remains, having so recently written to Dr. Wilson on the subject for the Asiatic Society, but it may be fitting to mention that I find them of four kinds—

1st, *Cromlechs.*—Erections consisting of three large slabs of stone set edgeways in the earth, with one large slab as a covering: one side, usually the South, is open. These erections vary much in size; the largest slabs I have seen are about 12 feet long, 8 to 10 feet broad, and 1½ thick. They do not contain any remains.

2nd, *Kistvaens, or closed Cromlechs.*—These are similar to the others, only that all four sides are closed; and usually in the South slab, about the middle, is a round hole, from 6 to 9 inches in diameter. These contain earthen vessels filled with earth, calcined human bones and ashes, mixed with charcoal.

3rd, *Cairns.*—Circles of stones, double and single, surrounding small *tumuli:* when opened to a depth of 8 to 12 or 14 feet, stone chests, composed of slabs of stones, are found, containing skeletons, accompanied by remains of spear-heads, and other weapons, earthen vessels, &c. In others, larger vessels, containing human bones and ashes, with charcoal, similar to the kistvaens, and no stone chests.

4th, *Barrows.*—These are larger than cairns, and consist usually of several cairns, or one large one, surrounded by others, as at Shapoor.

6. The vessels in these cairns &c. are all of the same character,—strong earthenware, with a bright red glaze; some have a black glazing also, some are half red and half black. It is worthy of remark that vessels of the same colour are found in these remains in Europe, and on the Neilgherries.

7. I have written privately on this subject to Bellary, and to a friend in the Mysore Commission, whose district adjoins Bellary, and shall hereafter do myself the pleasure to communicate any discoveries which may be made.

8. As the subject is of considerable antiquarian interest, in consequence of the coincidence of these remains and those of Europe, I trust I may be excused for directing such particular attention to them; but it is very desirable that they should be traced as far as possible, with a view to define the boundaries of the expeditions in India of this probably nomadic tribe.

9. It would also be curious to trace whether any of these remains exist in Cutch, Guzerat, or Khandeish, as well as in the Northern part of the Dekhan. Notice might also be given of the subject in Scinde, and if remains exist there, they might possibly be traced onwards, though this is a mere hypothesis.

10. The only other objects of antiquity in the Shorapoor district are the inscriptions in old Canarese which exist at Sirwal, Yeoor, Kembhavee, and other places where ancient Singum temples exist. I have understood that these have already been included in the collections of Mr. Walter Elliott, of Madras, and I have referred to him for information: should they have escaped him, I shall do myself the honor of transmitting them to the Society.

I have, &c.,

(Signed) MEADOWS TAYLOR, Captain,
On special duty, Shorapoor.

Shorapoor Districts, Camp Jourghee,
27th February 1851.

The Secretary stated that a subscription list had been opened, according to the request of the Society, for reprinting the "Transactions of the Literary Society of Bombay" in an 8vo. form, which Messrs. Longman and Co. had agreed to do if one hundred subscribers at Rs. 20 each could be obtained, and that sixty-four copies had already been subscribed for. The Society then requested that non-resident Members should also be invited to subscribe, and the community generally.

Major LeGrand Jacob moved for discussion at the next Meeting,

—"That measures be taken by the Society for the recovery, if possible, of the Inscriptions alleged to have been removed from the Temples of the Sun and of Somnath, in the Guzerat Peninsula, by communication to the parent Society, by notice in the papers, and in other suitable modes." Major Jacob stated that as the local tradition was prevalent that the slabs containing the Sais Inscriptions were taken from the temple by gentlemen, they might probably be now deposited in some public or private Museum, and every year that passes without endeavouring to regain them only adds to the risk of again connecting them with the history of the country.—*24th April* 1851.

The following letter from the Hon'ble J. P. Willoughby, Esq., late President of the Society, tendering his resignation, was read :—

"To H. J. CARTER, Esq., Secy. B. B. R. A. S.

"SIR,—In consequence of my approaching return to Europe, I beg that you will do me the favor of intimating to the Society my resignation of the office of President, and at the same time express to the Society the deep and warm interest I shall always feel in its prosperity, and in the success of its endeavours for the advancement of literature and science in India.

"I have the honor to be, &c.

"*Bombay, 25th April* 1851." (Signed) "J. P. WILLOUGHBY.

The Revd. Dr. Wilson, Honorary President of the Society, seconded by W. E. Frere, Esq., then proposed the following Resolution :—

"That the Society, on accepting the resignation of its President, the Hon'ble J. P. Willoughby, Esq., beg to express to him their best thanks for the ability and courtesy with which he has uniformly discharged the duties of the chair; the valuable assistance he has so frequently rendered the Society; and the great interest which, during many years, he has taken in its various proceedings."

This resolution was carried unanimously, and the Secretary requested to communicate the same to Mr. Willoughby by the following mail.

The letters Nos. 1808 and 1830 of 1851, from J. G. Lumsden, Esq., Secretary to Government, General Department,—the former sanctioning the employment of Mr. Fallon, Portrait Painter, &c. for twelve months, to illustrate the Caves of Elephanta, and the latter requesting the Society to propose some one to copy and take impressions of the Cave-temple and other ancient Inscriptions throughout the Presidency,

having been acted upon by the Cave-temple Commission, the Secretary stated that Mr. Fallon had already been engaged a month at Elephanta in the way mentioned, and that a party had been proposed by the Commission to Government for copying the Inscriptions, &c.

Letter No. 1832 of 1851, from J. G. Lumsden, Esq., forwards copy of a letter No. 4, idem, from Captain Kittoe, (Architect, Benares College, and Archæological Engineer, Bengal,) to the address of Government, in reply to one received from the latter with a copy of Dr. Wilson's "Memoir" on the Cave-temples, &c.; also a printed copy of some articles written by Captain Kittoe on the Caves of Gya, and other Antiquities of the province of Behar; together with an Address to the President and Members of the Bombay Branch of the Royal Asiatic Society, from Captain Kittoe, respecting the necessity for all engaged in archæological research to communicate regularly with each other, and to interchange copies of Inscriptions as well as drawings, particularly of Idols and of architectural features, as well as notes on the same.

The address, after having been read to the Society, was directed to be handed over to the Cave-temple Commission; and a copy of each No. of the Society's Journal, as it is published, to be forwarded to Captain Kittoe, that he might be informed of what the Society is doing in this respect.

The Secretary having stated, with reference to reprinting the three volumes of the Literary Society's Transactions, that there were subscribers for 65 copies, was requested to invite the non-resident Members to join in the subscription, and the community generally;—100 subscribers at Rs. 20 each being required to make up the cost of the reprint.

A letter was read from Mr. Fallon, dated Elephanta, 19th ultimo, calling the Society's attention to the flooding of a part of the Caves which will follow the late removal of earth from the Eastern side, and which will render the Caves most unhealthy during the fair season; also suggesting that it might be easily avoided by cutting a trench from the part where the water will collect to the declivity of the rock.

The Secretary was requested to forward a copy of Mr. Fallon's letter to Government, stating the desirableness that these Caves, already so notoriously malarious, should be rendered as healthy as possible, not only for the sake of enabling Mr. Fallon to complete his illustrations of them, but for the sake also of people who may hereafter visit them as a matter of curiosity.

The following alterations in the Society's Rules, proposed by Captain French, seconded by Captain H. Barr, were submitted for discussion at the next meeting:—

1st. That in lieu of the words "One hundred Rupees" and "Thirty Rupees" in Article XXI. of the Rules, "Rs. 50 and 12" be inserted, as the Annual Subscription of resident and non-resident Members respectively in future.

2nd. That the above shall not affect the present Members of the Society in the current year, but be applicable solely to the new Members, and all Members for the year 1852.

3rd. That in consideration of the present wants of the Society, and the anticipated increase to its Members, should the first proposition be carried, an Assistant Secretary, on a salary of 100 Rs. per mensem, be sanctioned, he however always being an Ordinary Member of the Society.

Dr. Gibson's communication (p. 140) was then read. The hot springs at the Lukkee Pass, in Scinde, are stated to issue from limestone: they are sulphureous, and the degree of their temperature varies.

That at Kal-Droog, in the Northern Concan, flows from the trap; its temperature is 130°, and taste strongly saline. With the exception of this one, Dr. Gibson has not met with any springs from Kandeish and Surat southward to Rajpoor, impregnated with saline matter; but has heard of one in the vicinity of the last mentioned, viz., at Vehlolee, near Dysar, in the Bassein talook, which he recommends visiting. The Vaziriabhoy spring is not saline. He also alludes to the intermittent cold springs "at Rajapoor, in the Southern Concan; and to a hot spring at Rajapoor, in the low valley which encloses the river; the former are situated on the slope of an adjacent hill, and are stated to be only active during part of the year; they are also said to burst out from May to July, and to continue running from three to four months.—22*nd May* 1851.

Election of President.

The Hon'ble Sir Erskine Perry, Knight, Chief Justice of Bombay, having been proposed by the Revd. Dr. Wilson, Honorary President, seconded by Roderick Mackenzie, Esq., was unanimously chosen to fill the vacant office of President, caused by the departure to Europe of the Hon'ble J. P. Willoughby, Esq.

It was resolved that a deputation, consisting of the Revd. Dr. Wilson, Professor Harkness, and the Secretary, should wait upon Sir Erskine Perry, to request his Lordship to do the Society the honor to accept its Presidentship.—12*th June* 1851.

The Hon'ble Sir Erskine Perry, having accepted the office of President, expressed his thanks to the Society for his election.

Captain French brought forward his propositions for reducing the Subscriptions of resident and non-resident Members, recorded in the Minutes of last Meeting, which were not carried, 19 having voted for, and 23 against them.

Professor Harkness, seconded by Captain Estridge, proposed, for consideration at the next meeting,—"That no question once disposed of by a vote shall be again brought forward for discussion within twelve months."—*17th July* 1851.

Professor Harkness brought forward his motion, recorded in the Minutes of the last Meeting, and A. Malet, Esq., seconded by the Rev. Dr. Wilson, Honorary President, moved as an amendment—

"That no alteration in the Rules of the Society be made, except at an Anniversary Meeting, or at a Special Meeting, by a majority of the resident Members."

Professor Harkness then withdrew his motion in favor of the amendment, which, having been put to the Society, was carried by nearly all present.

A. Malet, Esq., moved for consideration at the Anniversary Meeting:—

"That Subscribers be admitted under direction of the Committee of Management at Rs. 24 per annum, paid half-yearly in advance, which shall entitle them to read in the Society's Library, and to take out one work at a time, but not to have works circulated to them.

"Should the work consist of more than three volumes, or should a larger number of books be required by the Subscriber, the Committee of Management to have the discretionary power of complying with their request."

Captain French intimated his intention to move at the next meeting—

"That a printed Catalogue of the works added to the library, with the cost of each, (if purchased,) since the last Annual Meeting, be yearly laid on the table, and a copy sent to every Member, resident and non-resident."

On the application of Dr. Wilson, the Society agreed to present to the University of Leipzig, through Dr. Grant, who lately visited Bom-

bay, one of the remaining copies of the lithographed edition of the Vendidad and Liturgical works of the Parsís, with the Gujarátí translation of Framjee Aspandiarji. The learned establishment at this place, Dr. W. stated, had been overlooked, when copies of these works were formerly sent to Europe; and it is entitled to the courtesy of a presentation copy, not only from its own importance, but from the research of its present Sanskrit Professor Brockhaus, who has lately published an edition of the Vendidad, &c. in the Roman character, with a valuable index, illustrative of the present state of the philological investigation of the Zend language.

Dr. Wilson also stated that an opportunity having offered itself of directly forwarding a complete copy of the Society's Journal to the Society of German Orientalists, it had been embraced. The Society approved of what had been done in this matter, as it regularly receives the Zeitschrift of the German Society on its publication, and directed its own Journal to be regularly forwarded in exchange in future.

The Secretary stated, with reference to the subscription list for reprinting the "three volumes of the Transactions of the Literary Society of Bombay," that 77 copies had been subscribed for, and requested that the reprint might now be ordered in octavo, &c. &c. as proposed by the Hon'ble J. P. Willoughby, Esq., at the Society's Meeting held on the 20th March last.

With reference to the letter from Government, No. 3261 of 1851, forwarding a number of lithographed copies of Captain Taylor's letter, bearing date 27th February last, on the remains of Cairns, Cromlechs, and Kistvaens, in the Shorapoor Districts, and the desirableness of ascertaining if similar remains were to be found in other parts of this Presidency, it was resolved that copies should be handed over to the Cave-temple Committee, for distribution in such a manner as would render Captain Taylor's object most likely to be attained.

Dr. Bradley's paper (p. 140) on Rock-cut Caves of Aurungabad was also handed over to the Cave-temple Committee, for their forthcoming report.—14*th August* 1851.

The Hon'ble the President, seconded by Captain French, proposed the following resolution, viz:—"That as no division took place on Mr. Malet's motion, which was carried at the last Meeting, there is no evidence on the Minutes to show that it was decided by two-thirds of the Members then present, and therefore the resolution adopting the motion is void under Art. XVIII. of the Society's Regulations."

The Revd. Dr. Wilson, Honorary President, seconded by Captain Forbes, then moved as an amendment:—"That it is competent to this Meeting to declare that the majority in favor of Mr. Malet's motion, which was carried at the last Meeting, consisted of two-thirds of the Members then present."

The amendment was submitted, and lost by a small minority, and the original motion carried by the casting vote of the President, six having voted for, and six against it.

The Hon'ble the President, seconded by Captain Forbes, intimated his intention to move at the next Meeting,—"That it be referred to a Select Committee to consider whether any change can be made without injury to the Society in reducing the Annual Subscription, in order to make it more accessible to scholars, and to promote the further investigation of Oriental Arts and Sciences."

It was also proposed by the Hon'ble the President, seconded by the Revd. Dr. Wilson, "That a Special Committee, composed of the Revd. Dr. Stevenson, Captain French, H. Conybeare, Esq., and the Secretary, be appointed, to report on the present state of the Society's Museum, and the arrangements that might be made for extending its utility." Agreed to.

Proposed by the Revd. Dr. Wilson, seconded by Dr. Don,—"That Dr. Leith, Professor Harkness, and the Secretary, be appointed to receive the books ordered for the Malcolmson Testimonial, and to carry into effect the remaining part of the Society's resolution respecting them." Agreed to.

The letter from Dr. Buist having been read, forwarding copy of one dated 10th March 1851, from M. F. Maury, Esq., intimating that a box had been sent to Smith, Elder and Co., containing, among other things, the following presents to the Bombay Asiatic Society from the National Observatory at Washington, viz.—1 vol. Astronomical Observations, and a complete set of Charts, as far as published, the Secretary was requested to acknowledge the intimation, with the Society's best thanks, and to present a complete set of the Society's Journal in return to the National Observatory of Washington, taking advantage of Dr. Buist's kind offer to forward the parcel free of charge.

The letter from Captain Eckford, submitting a plan for the illustration of the monuments of antiquity in Western India, in accordance with the views of the Hon'ble the Court of Directors, was handed over for the consideration of the Cave-temple Committee.

Dr. Wilson, referring to a letter addressed to him by Assistant

Surgeon F. Broughton, dated Kolapore, the 25th ultimo, mentioned that several ancient excavations and temples had lately been discovered by that gentleman, which would be duly brought to notice in the next Memoir of the Cave Commission.—11*th September* 1851.

Dr. Wilson read an extract of a letter to his address from Professor Westergaard, of Copenhagen, dated the 21st July last, thanking the Society for its subscription to his critical edition of the Zend writings; intimating his publication of an edition of the Pehlivi Bundehesh, and his presentation to the Society of a copy; and expressing his opinion, founded on a critical examination of the so-called Pehlivi writings, that they are not in any Sasanian language, but merely in a dialect (probably the Kirmanian) of the modern Persian, disguised by the use of an imperfect alphabet, often now mis-read by the Parsís, the Shemitic words introduced into it being merely corrupted Arabic. Dr. Wilson, after illustrating Mr. Westergaard's theory of the Pehlivi by a few examples, expressed his entire concurrence in it, and stated that it accorded with suspicions which he had now for some time entertained.

The Government letter No. 3837, forwarding a copy of one from H. B. E. Frere, Esq., to the Government, with a communication respecting the remains of Cromlechs, Cairns, Barrows, &c. in Scinde, by Captain Preedy, Collector of Kurrachee, was handed over to the Cave-temple Committee.

In accordance with the request of the Society at last Meeting, the Committee then appointed to look into the state of the Museum, &c. had assembled, but had not been able to procure all the estimates necessary to accompany their report, of which that part alone was complete which had reference to alterations necessary to protect the present specimens from being destroyed by the dust. This having been read, the Society sanctioned the disbursement necessary to defray the expense of these alterations.

Captain French's motion respecting the printing of a list of the works annually purchased by the Society, recorded in the Minutes of the Meeting before last, was unanimously carried.

The Hon'ble the President's motion, proposed at the last Meeting, respecting the reduction of the annual Subscription, was also carried, with the exception of the words "the Committee" being substituted for "a Select Committee," 14 having voted for, and 4 against this amendment.

A. Malet, Esq., C. S., then moved the following Resolutions:—

1st. "That at a Meeting of the Society the perusal by the Secretary of the Proceedings of the previous Meeting is solely for the purpose of verifying the correctness of the Secretary's record." This was unanimously carried.

2nd. "That it is not competent to a Meeting to decide on the validity of the Proceedings of a former Meeting, in the absence of the notice of intended discussion required by Art. XVIII. of the Rules."

To this Dr. Stevenson, Vice-President, seconded by Captain French, moved as an amendment—"That this question be referred for the opinion of the Committee of Management." The amendment was carried, 12 having voted for and 4 against it.

3rd. "That the Resolution of the last Meeting, by which, without the notice of discussion required by Art. XVIII. of the Rules, a Resolution of the previous Meeting was annulled, be rescinded."

To this also Dr. Stevenson, seconded by Captain French, proposed the foregoing amendment.

The Revd. Dr. Wilson then moved, "That in addition the Committee be further requested to ascertain and report upon the facts connected with the voting for the resolution referred to in the latter part of Mr. Malet's third motion." This was submitted to the Meeting, and lost, 6 having voted for, and 9 against it.

Dr. Stevenson's amendment in its original state was then put and carried unanimously.—*9th October* 1851.

Government letter No. 4049 of 1851, forwarding a copy of further communications from the Commissioner of Scinde, descriptive of certain ancient remains in that province, was handed over to the Cave-temple Commission.

With reference to Government letter No. 4004, offering to place the returns of the last Census at the disposal of the Society, the Secretary was requested to acknowledge the same with the Society's best thanks, and to state that they will be very acceptable; for, although not deemed trustworthy, as stated by the Government, they might prove useful in pointing out the practical difficulties with which Captain Baynes had to contend, and which led to their incorrectness, and thereby perhaps suggest some more effectual method of taking the Census of Bombay on a future occasion.

The report of the Committee of Management was read, respecting the possibility of reducing the Society's Subscription, &c. without injury to

the Society. The Committee had gone deeply into the subject, and considered that it was impossible. There would be a great annual deficit with the reduced Subscription, which must be supplied by reduction in the establishment, and in the purchase of books, or by the addition of many more new Members to the Society than could be anticipated; at the same time the Committee considered that the resources of the Library and Museum might, under proper restrictions, be placed freely and gratuitously at the service of persons engaged in literary or scientific pursuits, and that it might be as well to increase the powers of Members in this respect, and to allow the Committee to give access to anything under their charge.

The rest of the Report, which is lengthy, and accompanied by financial calculations, was received.

Captain French, seconded by the Revd. Dr. Stevenson, then proposed for discussion at the next Monthly Meeting :—

"That the Subscription is not intended to exclude learned students, natives of Bombay, who find it inconvenient to pay the full Subscription, from joining the Society as resident Members, and that it be referred to the Committee to devise some feasible scheme for that end."

Dunjeebhoy Framjee, Esq., Member, having laid before the Society for its approval a specimen of a Zend Dictionary in the English language, read the following Prospectus concerning it :—

"I have the pleasure to lay before the Society a specimen of a Zend Dictionary in the English language, which I have been engaged in preparing for several years, and I hope you will approve of it; and I beg leave to request the Members of the Society to suggest to me any improvement that may occur to them in regard to the execution of the work.

"It is intended to supply a desideratum greatly felt by the Parsís both of India and their mother country, Persia, for more than two thousand years, and to some extent by the Continental Orientalists.

"I have undertaken to publish the work in the English language as well as in the Guzerati, at the request of a few of my learned European friends, who are willing to promote the general interests of Oriental literature.

"A specimen of this work in the Guzerati language was kindly first inspected by our learned Honorary President, the Revd. Dr. Wilson, by direction of the Bombay Government, and I am indebted to him for expressing his desire that I should make an English version of the work, a suggestion which I considered it right to adopt.

"This work will be published in the two languages in two separate volumes, viz., volume 1st in English, and volume 2nd in Guzerati, with the original Zend words, with their respective transcriptions, and significations, and parts of speech.

"In this work upwards of a thousand notes will be interspersed, with philological and etymological explanations, for the purpose of a comparison of my humble opinion with those of the Parsí Priests and Continental Orientalists.

"For specimens of these notes I beg to refer you to the papers now laid before you.

"At the commencement of this work is a comparative table of the Zend Alphabet with those of the Persian, Pehlivi, Hebrew, Cuneiform Sanskrit, Guzerati, Greek, and Roman languages, in which their articulation is pointed out in their respective classes.

"Plate second contains a comparison of the Zend Orthography, according to the different systems of sixteen Asiatic and European Orientalists.

"Part 1st. Preliminary Discourse on the origin and authenticity of the Zend language and Zend Avesta.

"Part 2nd. Observations and Dissertations on the Zend Orthography.

"Part 3rd. Rudiments of the Zend Grammar.

"Part 4th. Table of the Zend Alphabets, according to the different Ravayats, and other manuscripts, &c.

"Part 5th. General remarks on the manuscripts and printed works of the Zend Avesta, &c. &c.

"Part 6th. The Pehlivi Alphabets, published with observations on the Lapidary, Cursive, and Numismatic, according to the different forms of their alphabets, to assist Pehlivian Scholars to decipher any of the Pehlivi writings of Tablets, Manuscripts, and Coins."

A letter was read from Dr. Crawford, descriptive of a large meteor which he had seen from the deck of the Steam-frigate "Zenobia," on the 7th September last, at 8 P. M., in Lat. 12° N. and Long. 46° 11′ 30″ E. It first appeared 40° above the horizon, bearing E. and S., and then pursued a horizontal course northward, vanishing at a point bearing NE. by E.—13*th November* 1851.

ANNIVERSARY MEETING.

Monday, 24th November 1851.

The Minutes of the last Meeting having been read and confirmed, the following Gentlemen were elected for the Committee of Management, Museum Committee, and Auditors for the ensuing year, viz :—

Committee of Management.

S. S. Dickinson, Esq.	Professor J. Patton, M.A.
Henry Young, Esq.	A. H. Leith, Esq.
Lieut. Col. J. Holland.	Revd. P. Anderson, M.A.
William Howard, Esq.	Professor Harkness, M.A.
J. Smith, Esq.	J. Don, Esq., M.D.

Museum Committee.

A. H. Leith, Esq.	Professor J. Harkness, M.A.
J. Smith, Esq.	Professor J. Patton, M.A.
H. Conybeare, Esq.	H. J. Carter, Esq.

Auditors.

A. Spens, Esq.	Captain J. G. Forbes.

Election of Vice-President.

Arthur Malet, Esq., Chief Secretary to Government, proposed by the Revd. Dr. Wilson, Honorary President, seconded by P. W. LeGeyt, Esq., Vice-President, was chosen to fill the vacancy among the Vice-Presidents, vacated by the late Colonel G. R. Jervis, of the Bombay Engineers.

The Motion of Mr. Malet, recorded in the Minutes of the Society's Monthly Meeting held on the 14th August last, was put as amended in the following form, seconded by the Revd. Dr. Wilson, viz :—

"That the Committee be requested to take into their consideration the expediency or otherwise of the formation of a class of Associate Members, who may enjoy its literary fellowship, and a restricted use of the Library, at a reduced rate of subscription, but without any interference with the Management of the Society by its constituent Members." This was unanimously carried.

A list of the works ordered for the "Malcolmson Testimonial" was laid before the Meeting. They are to be lettered on the backs

"BOMBAY ASIATIC SOCIETY," and "MALCOLMSON TESTIMONIAL," and stamped inside with the same, and will be placed in an appropriate part of the Library, headed also "MALCOLMSON TESTIMONIAL."

The following have been received :—

WORKS ON GENERAL NATURAL HISTORY.

	VOLS.
NATURALISTS' LIBRARY. Edited by Sir W. Jardine, Bart.	40
DICTIONNAIRE UNIVERSEL D'HISTOIRE NATURELLE, with Atlas. 8vo. Edited by C. D'Orbigny.	16
ANNALES DES SCIENCES NATURELLES. 1re Série. 8vo..	30
——— Table Générale Alphabetique de	1
——— 2me Série, Tomes 40 in 20. ..	20
——— 3me Série, Tomes 26 in 14, up to 1850...	14

WORKS ON BOTANY.

Filices.

HOOKER, (W. J.,) and GREVILLE, (R. K.,) Icones Filicum. Folio ..	2

Algæ.

AGARDH, (C. A.,) Icones Algarum Europœarum. 8vo.	1
HASSALL, (A. H.,) History of the Fresh Water Algæ, &c. 8vo... ..	2

WORKS ON ZOOLOGY.

Zoophyta.

LAMOUROUX, (J. V. F.,) Histoire des Polypiers Coralligènes Flexibles. 8vo.	1
LAMOUROUX, (J.,) Exposition Méthodique des Genres de l'Ordre des Polypiers. 4to.	1
ELLIS, (J.,) Natural History of many Curious and Uncommon Zoophytes. 4to.	1
ELLIS, (J.,) Natural History of the Corallines, and other Marine Productions. 4to...	1

Acalepha.

LESSON, (R. P.,) Histoire Naturelle des Zoophytes Acalèphes. 8vo. ..	1

Entozoa.

BLANCHARD, (M.,) Les Intestinaux (Le Règne Animal, distribué d'après son Organization, par Cuvier, Ed. par une réunion, &c.) 8vo. ..	1

Infusoria.

DUJARDIN, (M. F.,) Histoire Naturelle des Zoophytes Infusoires, with Atlas. 8vo.	2

Crustacea.

EDWARDS, (M.,) Les Crustacés (Le Règne, &c. &c.), with Atlas. 8vo. ..	2

Insecta.

	Vols.
FABRICII, (J. C.,) Entomologia Systamatica, with Supplement. 8vo. ..	6
FABRICII, (J. C.,) Mantissa Insectorum. 8vo.	2
DONOVAN, (E.,) Natural History of the Insects of India. New Ed. by Westwood. 4to.	2
DRURY, (D.,) Illustrations of Exotic Entomology. 4to.	3
HORSFIELD, (T.,) Descriptive Catalogue of the Insects in the Museum of the East India Company. Parts 1 & 2. 4to.	1
PFEIFFER, (L.,) Monographia Heliciorum Viventium. 8vo.	2

Mollusca.

NYST, (P. H.,) Description des Coquilles et des Polypiers Fossiles des Terrains Tertiares de la Belgique, with Atlas. 4to.	2
AGASSIZ, (L.,) Monographie des Coquilles Tertiares réputés identiques avec les Espèces Vivantes. 4to.	1

Cephalopoda.

FERUSSAC et D'ORBIGNY, (A.,) Histoire Naturelle Générale et Particulière des Céphalopodes Acétabulifères, Vivantes et Fossiles, with Atlas. Folio.	2

Pisces.

CUVIER, (Le Baron,) et VALENCIENNES, (M. A.,) Histoire Naturelle des Poissons. 8vo..	22

Reptilia.

DUMERIL et BIBRON, Erpétologie Générale, ou Histoire Naturelle complète des Reptiles..	7

Aves.

GRAY, (G. R.,) The Genera of Birds. Folio.	3
LATHAM, (J.,) A General History of Birds, with Index. 4to. 10 vols. in 6..	6

The Secretary having represented that more cases were required in the Society's Museum for the preservation of Specimens which are now lying exposed and loose about the Museum, as well as for the reception of others which might hereafter be presented, it was unanimously resolved that cases, of a similar construction to those in the centre, be placed round the walls of the Museum, for the purpose mentioned.

GEOLOGICAL MAP OF THE ISLAND OF BOMBAY.
Scale of one inch 1/2000 yards.
Riva Fort
Dharavi
Mahim
Black Jaspid Sewree
Kandlee Battery
Tank Bunder
Mazagon
Carnac Bunder
Cross Id.
Black Jaspid Rock
Dyke
Wadala
Matoonga
Nagoa
Splits
The Flats
Phipps Cut
Sindhi Para
Sydhia
Nagaon Hill
Nagaon Road
Nath
Girgaon
Malabar Hill
Malabar Point
Coal
Light House
Diagram.
Transverse Section of the Island of Bombay from a Vert 800 yds. N. of the Sluices to one 800 yds. N. of Jakariyah's Bunder

JOURNAL

OF THE

BOMBAY BRANCH

OF THE

ROYAL ASIATIC SOCIETY.

JULY, 1852.

ART. I.—*Geology of the Island of Bombay; with a Map and Plates.* By H. J. CARTER, Esquire, Assistant Surgeon, Bombay Establishment.

Presented December 1850.

DIFFICULT as it may appear to unravel the geological history of a tract of country which has been overflowed and ploughed up by successive volcanic effusions, and subsequently elevated, depressed, immersed, or denuded, or all four put together, yet, by patient investigation and search, such a knowledge of its structure and composition may be obtained, as to enable the observer to bring back, in his imagination, to their original state and position, the materials of which it was originally composed, and to place before the reader a satisfactory account of the changes which it has undergone during a given geological period,—changes which to him would otherwise be incomprehensible.

The little island of Bombay, just peeping above the waters of a muddy estuary, would seem to offer little or no novelty in this respect, particularly when compared with the great mountainous masses which surround it; but, when observed carefully, it will be found that what it lacks in size is compensated by amount of excavation, and that the latter has in all probability disclosed the geological type of the whole neighbourhood in its limited space.

Was the island of Bombay, as at first sight appears, composed of one mass of the same kind of dark-looking trappean rock, its geology might be told almost in as many words; but when it is found to present in its thickness the strata of an ancient lake, or river; a coal-deposit in miniature, filled with the fossillized debris of animal and vegetable remains, some, if not most, belonging to species now wholly extinct; and that there have been three or four successive effusions of volcanic matter over and into these strata, forming ten times as many different rocks, it naturally suggests the questions—How far did this lake extend? Was it a lake, or a river, or an estuary? On what kind of rock were its strata deposited? Of what material are its strata composed? To what extent does its coal deposit extend? What was its geological age? When was it destroyed and filled up? What rock first covered it? What kind of rocks subsequently forced their way into it? Has the island undergone any elevation or depression, and have any other strata been deposited on it since the period of active volcanic action ceased? Does the nature of its volcanic effusions, or their relative positions, bear any analogy to similar effusions in the adjoining islands, and on the main land itself?—are all questions which make the little island of Bombay assume a geological importance as interesting as at first it appeared to be unpromising. Let us now see if any of them can be answered.

From the following facts and observations, it will be evident that there have been three distinct periods in the formation of the island of Bombay, viz: 1st, the deposit of the fresh-water strata; 2nd, the volcanic effusions; and, 3rd, the deposit of the marine strata.

Of the Fresh-water Formation, which was of course the oldest, we are unable to come to any conclusions beyond the following, viz., that by the absence of marine fossils in it, and the presence of fresh-water ones, it was deposited in a lake or river; that its upper part is seen entire for 36 feet below the igneous rock which overlies it; and that below this again its strata have been intruded and broken up by other igneous rocks; so that, at present, we can neither tell its whole thickness, nor the nature of the rock on which it was deposited. As to its limits horizontally, it can only be at present stated that it extended all over the island of Bombay, and that portions of it may be seen in the volcanic breccia at Ghora Bunder, a little village on the northern extremity of the island of Salsette, thus giving it an extent north and south of at least twenty miles. We shall see also, by the presence of organic remains in this formation, that it must have been the depository of a large quantity of wood, leaves, fruits, &c., and that these are generally in a fragmental state, and jumbled together, as if they had been brought

from a distance; also that plants, having conical bulbous roots, with stems formed of concentric layers, as if made up of sheathing leaves, like large bulrushes, grew in this lake; that it swarmed with the little entomostraco-crustacean animals called Cypridæ, and that an abundance of small frogs and marsh-tortoises were also present. Moreover, that the material of which its strata are composed seems from its color and composition to be of volcanic origin, but deposited for the most part in a subtle state, though occasionally granular and coarse-grained, but never gravelly, and always argillaceous. This, from the thin layers of which the formation is composed, must have been deposited very gently, and would therefore come nearer to the sediments of a lake than those of a swift stream. At what geological period these strata were formed is not yet known, because there have been no fossils yet found in them which can determine this; but a time arrived when the volcanic material of which they are presumed to have been formed was no longer transported through the agency of water, but came in a molten fluid, and, filling up the lake, dried up or turned off its waters, and changed the then sub-lacustrine plain of Bombay into one of dry black igneous rock. This brings us to the second epoch. It is most probable that this lake was above the level of the sea at the time this occurred, although the general level of its strata is now below it. One other fact connected with the fresh-water formation is here worth mentioning, viz. that within three inches of the igneous rock which overlies it, there is a stratum three inches in thickness, almost entirely composed of the casts of Cypridæ,—not of their valves singly, which they are wont to shed annually, but their entire casts, showing that some sudden alteration of the water in which they were living took place, by which they all as suddenly perished and fell to the bottom. After this occurrence no organic remains are seen, and nothing but the three inches mentioned of a kind of transitionary material between the fresh-water formation and the basalt. The amount of coal in this formation will be seen to be very trifling, and that nearly the whole of the wood and other vegetable remains have been replaced by argillaceous material. At the same time, it will also be seen that it is only at one place that the highly carboniferous part has been exposed, and that, too, over an area only of a few square yards, viz. in the cutting of the sluices, where the main drain of the island empties itself into the sea.

2ND PERIOD.—This period commences with the effusion of the basalto-dioritic tract which caps the main ridges in Bombay, and which, it may be presumed, was at first continuous all over the island. How far this tract of lava extended it is not our present object to inquire; it is

enough for us to know that it extended over the then plain of Bombay: originally it was probably much thicker than it is at present, but the weathering of ages has of course much reduced it, though even now it may be seen to measure 90 feet thick on the eastern, and 51 or more on the western side of the island. Immediately after this effusion, we may conceive the site of Bombay to have been part of a black arid plain: how long this continued geologically we have no proofs to show, but after it had become hard, probably, and fixed, there was a second effusion, which, coming up under the first, and not finding a ready outlet, followed the course of the fresh-water strata below it, intercallating them, and breaking them up into all-sized fragments. This effusion was for the most part scoriaceous or cellular, and gave rise to the amygdaloidal structure which is now its chief characteristic; though in Nowrojee Hill quarry it is compact, which might have arisen from the superincumbent weight of diorite over it at this part. The amygdaloid rock is found invading the fresh-water strata in every part of the island, in one form or another, non-cellular or cellular; the cavities in the latter instance being filled with laumonite, green-earth, quartz, or calc-spar, according to the locality. The part which this effusion took in raising up the longitudinal ridges in the plain of the first effusion, and which ridges, running about N. by E. and S. by W., now border the eastern and western sides of the island, there is no evidence to show; but that this, or the third effusion, to which we now come, or both, were active agents in this matter, there seems to be no reason to doubt, for we find those parts of the ridges most elevated where these effusions are thickest, and in the western ridge either one or the other is seen filling up the internal angle of the roof-like elevation formed by the fresh-water strata there. We have, then, a basalto-dioritic effusion, and an amygdaloid effusion; and now we arrive at another effusion, which we shall term the volcanic breccia. How long an interval elapsed between the amygdaloidal effusion and that which gave rise to the volcanic breccia is as inconceivable as the duration of the interval which existed between the first and second effusions, there being nothing in the island of Bombay to give the slightest idea of either; but, that the volcanic breccia was formed subsequently to the amygdaloid, is proved by the presence of fragments of the latter among the fragments of the other rocks which form the heterogeneous compound of the former. The principal characters of this effusion are that it is composed chiefly of angular fragments of the fresh-water formation, varying in size from particles which are invisible to the naked eye to pieces some tons in weight; also that it contains fragments of various sizes of the two

foregoing effusions; and, lastly, that it is of great extent, forming a continuous tract from Carnac Bunder all long the eastern shore of the island to Sion, and there composing the plain and chain of hills which form the north-eastern part of the island; also, still further, the principal part of the mountains in the island of Salsette. It is this effusion which I think contemporaneous with the Laterite, and in some parts identical with it in every respect; but this will be better understood by a reference to the latter part of the detailed description of this effusion,—we are chiefly concerned with it here as an agent in the changes of form which the first plain of volcanic rock has undergone; and no one can witness the cropping out of this breccia all along the base of the highest parts of the eastern ridge, and its free effusion at the north-east part of the island, with wells extending into it 60 feet deep in Mazagon, and veins and dykes of it bursting through the basalto-dioritic tract in the same neighbourhood, without feeling satisfied, that to make room for such an immense mass, the crusts of the previous rocks must have given way, and have been forced ridge-like upwards, as we now see them, to give vent to the volcanic torrent, which, breaking through the fresh-water formation and igneous rocks that opposed its progress, finally spread their fragments in the manner we have seen them along the eastern shore of the island.

The protean forms assumed by this effusion and its decompositions, passing through so many different rocks, may easily be conceived; it is therefore white at one part, blue at another, yellow at a third, brown at a fourth, red at a fifth, and black at a sixth, with all the intermediate shades; composed, as before stated, of fragments of rocks in the immediate vicinity, changed into all kinds of consistences, and more than that indeed, fragments of large-grained diorite, which have come up from a region much below any we are acquainted with in Bombay. As to structure and hardness, it presents every stage, from the coarsest and softest argillaceous breccia, which may be cut with a knife, to the blackest and hardest homogeneous jasper, seen at the hills of Antop and Sewree. Such a destructive agent, then, as this effusion must have been, might be safely allowed to have been the one most active in the upheaval of the longitudinal ridges in the island of Bombay, if not the mountains in the island of Salsette also. Lastly, we have a fourth effusion, and this is proved by the existence of dykes of volcanic breccia through the last mentioned. Of their contents, little can be made out, and they prove nothing further, than that the third was not the last effusion. In the detailed descriptions of the three latter effusions, I may have mentioned some little tracts as pertaining to one which

may pertain to another; but it is almost impossible to expect accuracy in this respect with effusions which are all more or less alike, and errors of such kind, after all, are of little importance, as they cannot affect the grand facts, and, moreover, the observer may correct them as he best likes himself. That there have been four successive effusions there can be no doubt; and that the three latter, pursuing a course in the first instance under the basalto-dioritic tract, have all contributed to destroy its horizontality, by raising up the ridges which now exist upon it, is equally obvious. With the dykes, which have been last mentioned, the period of active volcanic action in the island of Bombay seems to have ended; how far passively the island has since been affected there is nothing to determine.

3RD PERIOD.—*Deposition of the Marine Formation.*—There is nothing in this to make us think that it is of very ancient date geologically: it would seem to belong to the Post and Newer Pliocene Formations. The clay and lower part of the beach, as no remains of human bones or artificial structures have I think been found in either, perhaps belong to the former, while the shells consist of the same species as those which are found on the shore at the present time. That the island has undergone elevation since the period of volcanic action ceased would seem to be proved by the remains of a portion of sea-beach called Phipps' Oart, in the centre of the island, near which no sea now comes; but this elevation must be very trifling, for the ridge of a beach is always higher than the sea, even at the highest tides, and the summit of this is only eight or nine feet above high-water mark, while the accumulation of detritus poured into the estuary of Bombay from the neighbouring hills is as likely to have produced this, and to have filled up the lagoonal depression in the centre of the island to the level of the sea, as anything else.

At the same time, Bombay could never have been very deep, or long under water, or the deposits on it would have been much thicker than they are, and of more ancient date: as it is, the beaches hardly exceed 20, and the clay 10 feet in thickness. Where there is no clay, as close to the shore, the beaches are thickest, and *vice versâ*.

The analogy which the basalto-dioritic tract and amygdaloid effusions bear to those on the main land are most striking, and may be seen by a reference to Colonel Sykes' valuable paper on the Trappean Region of the Dekkan and Konkan, immediately opposite,*—that of the adjoining islands I hope at some future period to show myself.

* Trans. Geol. Soc., 4to, second series, vol. iv. p. 409.

Such is a short summary of the geology of the island of Bombay, and I have premised instead of appended it, in hopes that the reader may be induced to peruse the following descriptions in detail from which these inferences have been deduced; let us begin with a brief outline of its geography.

The island of Bombay is trapezoidal in figure, having its long axis nearly N. by E., and S. by W., its short parallel side towards the sea, and its long one towards the land. The outer side is six miles long, and the inner one eleven miles; both are bordered by ridges of hills, scarped towards the east, while they slope gradually towards the west. Between these ridges, which are about two miles apart, there is a level plain, called the "Flats." The greatest width of the island is a little more than three miles.

At the two short sides of the figure there are sandy beaches, which, being above the level of the "Flats," prevent the sea from overflowing them, but on the outer side of the island there is no beach, because the whole is black basalt, probably extending a long distance into the sea; while on the inner side, which borders the harbour, there is an accumulation of silt, deposited from the back-waters, and the rivers which empty themselves into the estuary, in which the island of Bombay is situated.

The southern extremity of the outer side of the island is called Malabar Point, and the northern Worlee; while the southern extremity of the inner side is marked by the Light House, which stands on the extreme end of a thin prolongation called Colaba; and at the northern extremity is a tower called Riva Fort. Between Malabar Hill and the extremity of Colaba is a deep bay, called Back Bay, in which there is a sandy beach, and on the opposite or corresponding side of the trapezoid is a similar excavation, in which there is also a beach, called Mahim Sands. Both of these beaches are a few feet above high-water mark, and they chiefly prevent the sea from overflowing the centre of the island.

The highest point in the lateral ridges (which are interrupted more or less by breaks here and there) does not exceed 180 feet, which is the height of Malabar Hill just above the eastern corner of Back Bay. The southern part of the eastern ridge, called Nowrojee Hill, is 117 feet; Mazagon Hill, next to it, 162 feet; Chinchpoogly Hill, 153 feet; Parell Flag-staff or Colongee Hill 163 feet, above high-water mark; and Antop Hill, which is in the centre of the little range bordering the north-eastern part of the island, is 85 feet; while another hill in the

same range, a little to the north of it, is about 127 feet above high-water mark,—the latter has been measured by comparison.

The Flats are but just above the level of the sea, which overflows a small portion of them at the "springs," and the ridges of the beaches average about six feet above high-water mark.

From this description, it must be evident that a section of the island of Bombay, either longitudinally or transversely, if proportionally given, will have a very insignificant appearance. (See Map.)

With respect to its relations with the main land, Bombay is separated to the northward from the mountainous island of Salsette, which is six or seven times larger, by a channel, narrowing to a point not more than 125 yards wide; while Salsette, again, in like manner, is separated from the main land by a similar channel. To the south and east of Bombay is its harbour, in which are also several mountainous islands and islets, which lie scattered between it and the main land. The harbour, or estuary, is about six miles across in its widest part.

This short geographical introduction will be sufficient to explain the map of the island of Bombay hereto annexed; let us now proceed to its geology.

Insignificant as the elevation of Bombay is from its low hills and general flatness, yet it is by no means so in geological composition, for although its structure is not known for more than 60 feet here and there below high-water mark, which, added to its highest point, gives only a total thickness of 240 feet, yet in this thickness we have from 30 to 50 feet or more of fresh-water strata, covered by volcanic rock, which has been thrown out over them, in some parts 90 feet thick, and pierced by various subsequent effusions even still thicker; together with a marine formation, filling up the lagoonal depression of the island, and consisting of mud, in some parts 10 feet, and in other parts sandy beaches, 20 feet thick. Thus we have abundance in a geological point of view to occupy our attention, although we have little geographically.

But, before proceeding further, it would be as well to consider the general composition of the ridges of the island, and then their mineralogical characters in detail, in order that we may arrive at a right understanding of the relative position of the rocks which compose them, and the names by which we intend to designate their various forms.

The rocks of Bombay, which chiefly form its ridges, come under the class volcanic, and all belong to the trappean system: there are no hypogene rocks, that is igneous rocks which have been formed below the surface, and afterwards raised above it. Besides these, there

is a series of aqueous strata, which comes under the head of fresh-water formations, from the character of its fossils; and this, as before stated, is overlaid, and intruded by, both the volcanic rocks.

The whole of the upper part of the eastern ridge, from Riva Fort to the end of Colaba, is composed of fine-grained diorite, more or less basaltic towards the summit, while the whole of the upper part of the outer or western ridge is composed of fine compact black basalt. Both of these rocks rest conformably on the fresh-water formation, which is composed of argillaceous and bitumenous shale, broken up by subsequent volcanic effusions, assuming the forms of trappite, aphanite, spilite, amygdaloid, &c.

Such is a brief outline of the general composition of the ridges, and the relative position of the rocks which compose them; the following are the mineralogical characters of the latter. I should here premise, also, that in nomenclature I shall chiefly follow Alexandre Brongniart's classification and mineral characters of rocks, as given under the article "*Roches,*" in the Dictionnaire des Sciences Naturelles.

Diorite, (syn. greenstone,) is essentially composed of felspar and hornblende, and is either coarse-grained or fine-grained—the former is generally the oldest: that of Bombay is fine-grained, and hardly admits of being recognized by the naked eye; but, when magnified, the dark green hornblende is easily distinguished from the less colored felspar. It is this compound which forms the upper part of the eastern ridge, and varies in color from green and blue to sometimes black. When it is very compact, sparkling, and sub-granular, its binary compound and crystallization almost undistinguishable, and its homogeneity almost complete, then we shall call it *basalt;* and in this state, possessed of a blue black, or deep purple color, it forms the upper part of the western ridge. Diorite, when forming part of a trappean effusion, may pass into basalt; hence we have the upper part of the eastern ridge in some places very basaltic. When the binary compound of diorite has an intermixture of blue earthy matter, it becomes a semi-crystalline rock, and this we shall call *trappite;* while, when there is no longer any appearance of the crystalline compound, viz. felspar and hornblende, and the whole is an earthy substance, it is called *aphanite,* from ἀφᾰνίζω, to make unseen, in allusion to the felspar. I shall not make use of the term "trap" as a specific appellation here, as it confuses, and trappite and aphanite will, I think, be found sufficient. In this way, then, the distinguishable binary compound of diorite may pass into the undistin-

guishable one called basalt,* or into the semi-crystalline one, trappite, or earthy one, termed aphanite, in which all traces of both the felspar and hornblende in a crystalline state have disappeared. Now, when aphanite is cellular, its cavities being filled with calc-spar in particular, chlorite, zeolites, quartz, amethyst, or calcedony, it is called *spilite*, and the other rocks, too, when cellular, and filled with such substances, are termed amygdaloid, or variolitic. Under the foregoing generic names, then, we have all the trappean rocks in Bombay included. We next come to the fresh-water formation, in which we have argillaceous shale, argillo-calcareous shale, and argillo-bitumenous shale, with small quantities of coal; also chert and jasper, arising from the exposure of the argillaceous strata to great heat. Add to the foregoing a volcanic breccia, composed of fragments of the other formations, bound together by a base of aphanite, more or less fine, more or less coarse; harder or softer, and sometimes passing into a black jasper, as at Sewree, and Antop Hill. Lastly, we have the blue and brown clay of the Flats, containing the calcareous concretions called *kunkur;* and the consolidated sand and sea-shells of the beaches.

Having thus premised sufficient to prevent a misunderstanding in the terms which will be used, and the kind of rocks they designate, let us now trace the different formations mentioned throughout the island, beginning with the diorite, which is the most prevalent, the most prominent, and the most widely-spread of all.

Diorite.—This rock forms the summit of all the eastern ridges, except that bordering the north-east part of the island, and will be found to extend continuously from the extremity of Colaba to Riva Fort, that is the whole length of the island. It is interrupted by breaks or breaches here and there, and diminishes in height towards both extremities; but between the fort and the village of Nagaum, a distance of five miles, it presents points of variable heights, rising to 163 feet above the level of high-water mark. In some of the breaks it appears to be so expended that its continuity is hardly traceable, as at Nagaum, while in other places, as at Nowrojee Hill, where it has been quarried, it is 90 feet thick. Again, the width of this tract varies, so far as it is observed superficially: it forms the whole of Colaba, and the eastern part of the Esplanade and Fort, and, of course, it extends into the harbour on one side, and, obscured by the beach which forms the

* Some basalts may of course be composed of felspar and angite, and, when this is the case, the rock is called "dolerite."

Esplanade, appears in Back Bay again on the other; but at present it will only confuse us to trace it where it is concealed, and, therefore, we will confine our observations to where it is exposed. It forms also the eastern part of the Native Town, at the northern extremity of which is the quarry of Nowrojee Hill, where, as before stated, it is seen to be 90 feet thick; here, also, its superficial area is greatly expanded, and extends continuously across the island from Mazagon Hill due west to the Flats, a distance of one mile. This breadth is greater than at any other part, and is prolonged from Nowrojee Hill due north to the Mount, a distance of one mile and a quarter. At this part, also, it has been intersected and pierced in all directions by a subsequent effusion, which we shall come to hereafter. At the Mount, it narrows again, and spreads out on Chinchpoogly Hill, and thence is continued on over Colongee or Parell Flag-staff Hill to the village of Nagaum; here it sinks to within a few feet of the level of the Flats, and is continued on in the form of a few boulders for half a mile, and then, rising again a few feet more or less, ends at Riva Fort, the northern extremity of the island. The principal feature of this ridge is, that it is more or less scarped towards the east, while it slopes more or less suddenly towards the west; a feature which, however, it should be remembered, is common to every hill in Bombay, without exception. Its summits and sides are also covered with naked rocks and boulders, from the mode of desintegration of the diorite, which follows the veins with which it is intersected; hence they are in cuboidal or polyhedral masses, and, when more minutely divided, end in becoming spheroids, throwing off concentric crusts.

The mineralogical composition and structure of this rock varies. Generally, its crystalline structure may be distinguished with a good magnifying glass, but sometimes it becomes so minute, and compact, and tough, that it almost takes on the form of basalt; still we may infer its composition by seeking out its structure in larger-grained specimens. In these we shall find tabular crystals of white felspar; amorphous crystals of green hornblende; a small quantity of green or blue earth, ("green-earth,") with more or less olivine; also small particles of peroxide of iron, or, probably, titanitic iron, or rutile, from its rich brown red color in some parts; all of which are caught up by the magnetized needle in their natural state when the mass is pulverized,—this, of course, can only be seen by manipulation under a high magnifying power. The presence of the iron accounts for the decomposition of the rock into greenish blue, then yellow, and lastly red earth, these being the usual colors which iron assumes in passing from its protoxide to its peroxidized state.

Further, it may be observed of this rock, *en masse*, that the upper part is tougher and more difficult to break than the lower part, while the latter, on the contrary, is more cleavable. Cavities are sparsely scattered in it, which contain varieties of scolezite or needlestone, the latter name being derived from its spicular crystallization. In some parts it is blacker than in others, while frequently it presents a spotted appearance, on account of the black portions being circumscribed instead of generally spread throughout the rock. I am unable to explain the latter appearance, except that the hornblende is blacker in these places than in others, probably from the greater quantity of protoxide of iron which it contains; in other words, that the distribution of the iron throughout the rock has been unequal, or has become aggregated in some parts of it more than in others during its crystallization or *ab origine*. In the next ridge I am about to mention, this mottled state prevails very much, and on weathering, the dark portions remain, while the lighter parts wear away, giving the surface a botryodal appearance, in which the spheroids are about the size of bullets. This form seems to answer to that called "*orbicular diorite*" (Bt.)

The next ridge we have to trace, and which is composed of the same rock, is very low, scarcely rising at one or two points more than 50 feet above the sea. It lies on the east side of the latter, and commences close upon the sea opposite Mazagon Hill, from the base of which it is separated by subsequent effusions of volcanic matter. Its rocks, which appear just above the sea at its commencement at Mazagon, rise gradually to Tank Bunder, where there is a high mound of it, after which it sinks below the mud, and subsequently makes its appearance again at Kandlee Battery: there, as at Tank Bunder, it rises to about 50 feet above the sea, and again sinks gradually, as it pursues a direct line northwards to within a hundred yards of the base of Colongee or Parell Flag-staff Hill, where it ends; being separated the whole way from the first ridge by the subsequent effusion to which I have alluded. It does not differ in composition or structure from the diorite of the first ridge, except that its surface in many places weathers into the botryodal form mentioned, particularly a little south of Tank Bunder; this is its great peculiarity. It is very insignificant in height, when compared with the first ridge; but is, in like manner, tilted up and scarped towards the east.

Lastly, we have a third ridge of diorite on the east side of the island, which begins at a point 400 yards N. E. of Kandlee Battery, called Jackaryah's Bunder, and 600 yards east of the first ridge. It pursues a course a little to the eastward of north, and, about a mile from its

commencement, attains a height of 78 feet, after which it gradually gets lower, and finally joins the first ridge about two and a half miles south of Riva Fort, or about half a mile beyond Nagaum. In mineral composition, structure, and physical features, it corresponds with the first ridge, being scarped on the eastern, and sloping more or less suddenly on the western side.

In addition to the main ridge, then, there are two other short ridges of diorite on the eastern side of the island, and all these rest on the fresh-water formation, as we shall see; let us now go to the western side.

Basalt.—The western ridge, which extends from Malabar Point to Worlee Fort, is entirely of black, or blue-black basalt, interrupted by a break or two. Its height, as before stated, in one part, exceeds that of any other hill on the island, being 180 feet above high-water mark, just over the western corner of Back Bay. Like the eastern ridge, it is scarped on the eastern side, and slopes more or less suddenly on the western one, passing off afterwards with a very slight inclination into the sea. In its broadest part it is about 600 yards wide, that is the distance between the scarped side and the sea, and everywhere it appears stratified, the lines of stratification dipping suddenly, in the ridged portion, towards the west. In its scarped portion it presents a columnar arrangement, consisting of large cuboidal masses, arranged one above another; while its surface in some parts presents an hexagonal prismatic arrangement, to wit on the shore at Worlee, and in Back Bay. It is fragile almost to brittleness a little beneath the surface, but superficially, where it presents the hexagonal arrangement, is exceedingly tough. Throughout it is minutely divided by intersecting quartziferous veins, the structure of which, where exposed, is open and cellular, and of a rusty color, while the centre of the polyhedral masses which they surround is firm, black, and compact. Like the diorite of the eastern ridge, it decomposes into spheroids, throwing off concentric crusts; in some parts, however, beneath the surface, it appears to undergo an irregular jointed disintegration, the surface of the fragments presenting a greenish-blue colored argillaceous earth, which afterwards becomes brown, yellow, or red. There is a remarkable absence of cellular cavities in this rock,—I do not know that I ever saw a trace even of any except here and there, where there was a little olivine: its chief difference from the diorite of the eastern ridge lies in its black color, and in its compact structure and minute texture, which defies all attempts at analysis by optical examination; also in its apparent stratification and hexagonal prismatic arrangement on the surface in some places, and in its more rectangular disintegration. Like

the diorite, however, of the eastern ridges, it rests on the fresh-water strata, but is nowhere pierced, to my knowledge, by any subsequent effusion. Thus, with these little differences set apart, it so much resembles the diorite of the eastern ridges that one can hardly consider it otherwise than as a more compact part of one and the same formation, which was once continuous across the Flats, but has been since separated by fracture, upheaval, and denudation. To this effusion, therefore, we will give the name of Basalto-dioritic Tract.

Fresh-water Formation.—Next in succession below the basalto-dioritic tract comes a series of aqueous strata, which, by their fossils, are proved to have been deposited in fresh water. They consist of argillaceous shale, which, so far as it has been exposed, appears to have been formed from the fine detritus of volcanic matter, with which is mixed a quantity of organic remains, both vegetable and animal. In their upper part they are of a light brown color, passing gradually downwards into a greenish or blueish deposit, and then into black bitumenous shale. In no part do they, to my knowledge, present any gravel or large detritus.

At their junction with the basalt, at the cut of the sluices at Lovegrove,—for we will, before tracing these strata over the island, study them at this part, where they are least disturbed, and best seen,—the basalt is decomposing for some distance up, and passing into spheroids, which become more and more divided, until they disappear altogether, and leave nothing but a few traces of their concentric crusts: at this point the basalt rests upon the aqueous strata, and presents a number of vertical tubes, filled with crystalline quartz. These tubes are about five or six inches long, about half an inch broad at the base, and taper towards the extremity: some rise immediately from the surface of the aqueous strata, others a little above it. They are either solid or hollow, and occasionally bifurcated below, and were probably air-cavities in their original state, perhaps produced by the evolution of gases from the vegetable matter over which the fluid basalt had spread itself. These tubes are best seen on the eastern side of Lovegrove Point, under the tomb of Mama Hajanee, near high-water mark; they exist also at the sluices, but I have not seen them anywhere else.

Lying immediately below this is the first stratum of the aqueous deposit, which is only three inches thick, and presents nothing, apparently, but the transitionary state of the volcanic into the aqueous formation. Next it, however, comes a remarkable layer, though not thicker than the foregoing, which is compact and siliceous: the peculiarity of this is that it is almost wholly composed of casts of the

shells of the little entomostraceous crustacean animals called cypridès, with which is mixed a variable quantity of vegetable remains, consisting of small short fragments of plants, without any particular shape. It also has another peculiarity, which is, that it is almost wholly composed of silex, in the form of amorphous or crystalline quartz, which has either wholly or partially filled the cavities of the shells, the forms of the shells themselves having disappeared. Hence we find this stratum in preference to all others chertified, jaspidified, or blackened and basaltified by heat; and thus we have in many places evidence of the existence of the upper part of the fresh-water strata, where the rest have had their stratification destroyed, or have had their structure almost wholly transformed into something else. This stratum is well seen at Lovegrove Point, and on the northern side of the break through which the sluices have been cut. It will be recognized by its whiteness, and its oolitic structure, immediately underlying the black basalt. At the northern side of the sluices it presents a remarkable fold upon itself, which, before it is understood, is very confusing, insomuch that it gives the appearance of two or three of these kinds of strata, instead of only one.

From this deposit downwards, for 36 feet, we have argillaceous shale, which was deposited generally in very thin layers of impalpable powder, but in some instances consisted of coarse grains, which from their blueish, greenish grey, and white colors, seem to be heterogeneous in composition, but are still all argillaceous. The color of these strata throughout would also appear originally to be greenish or blueish grey, which is deepest or blackest where there is most carbonaceous material, although in their upper part they are of a bright brown, or yellow fawn color, which tints on both sides diminish in intensity as the distance from the line of junction between the volcanic and fresh-water formations increases. Throughout these strata there is an abundance of fossilized vegetable remains; and towards their middle those of animals, to wit, tortoises, while at their lower part are found the skeletons of frogs. The vegetable remains consist chiefly of the fragments of plants, which at the upper part appear to have been small, but towards the lower part were much larger. In the upper part they have been nearly decarbonized, and replaced by siliceous or argillaceous material of a white, grey, brown, or bright yellow color, presenting under the microscope in many instances the polygonal or fusiform shapes of their original cellular structures, while towards the lower part they are black and carboniferous. Such as have been found entire, or possessing a recognizable form, will be described hereafter.

The next stage of these strata presents an interlamination of black

carbonaceous deposits; this occupies about a foot and a half, when it is followed by two and a half feet of shale, without black layers, imbedding a great number of globular and conical nodules, like septaria, which, on being fractured, generally exhibit the forms of bulbous roots or stems in their interior. These strata, which are the lowest of the undisturbed part of this portion, are harder and more compact in their structure than the foregoing.

We have now an intrusion of blueish or greenish grey colored volcanic matter, apparently composed of the ingredients of diorite, but all heterogeneously mixed up together, and in the form of argillo-siliceous material, imbedding large portions of carboniferous shale, and, from its napthous odour, impregnated throughout with the remains of vegetable matter. This extends down for twelve feet, or to the bottom of the cut of the sluices. It is, of course, unstratified, and presents a venous intersection, like volcanic rock. The upper six feet is of a lighter color than the shale immediately above it, and, although richly charged with small fragments of vegetable remains, contains little, when compared with the six feet below, which are full of large pieces of black argillo-bitumenous shale, bearing the remains of large flat long leaves, pieces of dycotyledonous wood, seeds, seed-pods, and various other fragments of the vegetable kingdom, all of a deep black color, and many sparkling and slightly coal-bearing, though chiefly composed or replaced by argillaceous material.

The coal, which occurs here and there in small granular deposits on the leaves, and about the argillized wood, burns with a bright flame, bubbles up, and leaves a shining black scoriaceous cinder, which lightens a little in color under the blow-pipe. Also portions of mineral resin, resembling "hatchetine" or mineral tallow, are occasionally met with; and invariably calc-spar in company with both these substances. The mineral resin is sub-granular, like bee's-wax, and breaks, but is too waxy to be pulverized; it floats in water, but sinks in alcohol; is translucent, of a weak pearly lustre, and of the colour of bee's-wax; feels greasy, and is inodorous; dissolves readily in turpentine, but not in ether or alcohol; becomes soft at a temperature just below 212° Fahr., but does not melt in boiling water; when exposed to a greater heat becomes very fluid, but does not take fire until the temperature is raised, when it burns away with a bright flame, leaving no residue. Besides vegetable remains, the little cyprides abound in all the masses of this shale; the elytra of insects have been found in it, and the remains of shells something like *Melania*, but all more or less blackened, argillized, and in a carboniferous state.

Fig. 1

1A.

1B.

2

3

3A

2

H.X.C

In no other part of the island has this rich carboniferous portion of the fresh-water strata been observed beyond the depth of a foot or two, affording only a few thin layers of the uppermost argillo-bitumenous deposits, viz. those in which the skeletons of the frogs are found. All, therefore, that we know of it, is from what has been exposed by the excavation of a few cubic feet at the cut of the sluices, where it has been broken up into fragments by the intrusion of the igneous rock. In no place has it yet been seen undisturbed, or resting on the formation on which it was deposited, and therefore no conception can be formed of its depth, or the rock on which it rests conformably.

Let us now turn our attention to a description of the fossils which have been found in this formation, beginning first with those of plants.

Roots.

Fig. 1, *a*, *b*, Plate vii., is bulbous, cormiform, ovoid, elongated; truncated above, pointed below; marked with transverse rows of short vertical parallel striæ, the rows extending more or less round the body, each row tapering towards its extremities, and ending in a point between that above and below it, in the manner of scaly imbrications. Striæ superficial, and sometimes continuous for some way longitudinally. Truncated end presenting concentric lines, like the petiolations of sheathing leaves; pointed end, where fractured, presenting a succession of coats, concentrically disposed. Length of specimen 5 inches; widest transvers diameter $2\frac{1}{4}$ inches. *Loc.* black shale.

Obs.—These roots are almost lapidified, from the compactness of the argillaceous material by which they have been replaced. They are black externally, where the striæ present the only carboniferous part about them; and a little lighter colored within. The rows of striæ shine in the manner of vegetable impressions in clay generally, and the petiolations in the truncated end are marked by delicate white lines of calc-spar. A few cyprides are seen in the interior of these roots, which shows that they must have been widely cellular, or hollow.

Fig. 2, *a*, Pl. vii.—This specimen is of the same description as the foregoing, but appears more globose. The oblique direction of the striæ from above downwards and outwards would also seem to indicate this. Like the foregoing, the striæ are in little bundles, hardly elevated above the surface, and only prevented from being continuous longitudinally by their being raised at one end more than the other. *Loc.* lowest part of the undisturbed shale, and in the intruded igneous matter.

Obs.—These are found in great numbers in that part of the shale just mentioned, and appear very much like septaria. They are less black than the foregoing, thus according more with the color of the strata in which they are chiefly situated. When fractured, they develope a kind of stem or bulb internally, with its largest or rounded end downwards, that is following the position in which they are found; but the accumulation of adventitious material around them makes it almost impossible to arive at their original size or shape.

Stems.

Fig. 3, *a*, *b*, Pl. vii., is a section only. Length $1\frac{1}{2}$ inches, and diameter $1\frac{7}{10}$ inches. Sub-round, slightly striated longitudinally. Truncated end presenting circular lines indicative of the petiolations of sheathing leaves, with the external one of the latter broken off towards the bottom of the specimen. *Loc.* lowest part of the undisturbed shale.

Obs.—This, or rather these pieces of stems, for there are many of them, would appear to belong to the bulbous roots last mentioned. There is very little appearance of a more consolidated portion having existed at their circumference; and internally the presence of cyprides shows that they must have been widely cellular, like the so-called roots; also the lines of petiolations before mentioned, that they must have been formed of sheathing leaves.

Under this head also comes *fossil-wood*, of which there appears to be a considerable quantity and of various kinds, chiefly dycotyledonous. One specimen met with measured two feet long, and six inches broad: it appeared to be a segment of a small trunk; the bark is on it, and, from the infiltration of a lighter substance between this and the wood, and the latter being deficient towards the centre, the whole was probably undergoing decay when immersed. The grain of the latter is distinctly seen, but the soft argillaceous matter which has replaced it, as in most other specimens of the kind, does not admit of a sufficiently fine polish to examine it more minutely. The bark presents externally a number of small projections, and is guttered into large irregular lozenge-shaped divisions.

In one part of the bark was growing a fungus, or portion of adventitious wood, which, on falling out, brought away a part of the trunk-wood itself. It is of a compressed circular shape, about $1\frac{1}{2}$ inches in diameter, and constricted at the base. Many of these kinds of bodies occur in this black carboniferous deposit, and will probably be found to have had the same origin.

No pieces of palm-wood have to my knowledge been found, with the

exception of one unsatisfactory specimen; but many small short fragments of wood which possessed a tubular structure, and present a segmental form, like pieces of the common bamboo. The latter occur here and there in almost every part of the fresh-water formation; above, where the vegetable remains are decarbonized, they are of a brown or grey color, and lower down, where they are carboniferous, of an intense black color. Besides these, the upper strata present innumerable fragments of small plants, many of which appear to be portions of the stems of grasses. They are all very nearly decarbonized, and replaced by siliceous or argillaceous material, of a white, grey, brown, or yellow color. Those which are grey present under the miscroscope a number of polygonal grains or crystals, like the polygonal cells of vegetable structures, while those which are brown and yellow often present the fusiform cellular structure. The crystals representing the former average $\frac{1}{271}$ inch in length, and $\frac{1}{60}$ inch in breadth; and the argillaceous bodies representing the latter $\frac{1}{43}$ inch in length, and $\frac{1}{2150}$ inch in breadth. Amongst the thousands of little fragments that I have seen towards the upper part of the strata, where they abound in layers, and seldom exceed an inch in length, I have not been able to discover, with the exception of a compressed stem and globular root of some wide grass or bulrush, and two small roundish leaves, which will be presently mentioned, one single fragment possessing a form that could be recognized.

Leaves.

Figs. 4, 5, Pl. viii., are the impressions of the two leaves last alluded to. The largest is oblong and oval, length $\frac{8}{12}$ inch, breadth $\frac{3}{12}$ inch. The smallest sub-round; length $\frac{4}{12}$ inch, breadth $\frac{5}{12}$ inch. *Loc.* upper part of brown shale.

Obs.—These leaves were found among the fragments just mentioned, where there were thousands of other portions, possessing the parenchymatous form of cellular structure mentioned, and, as before stated, without any recognizable form. They look more like leaflets of an accacia, perhaps, than anything else.

Fig. 6, Pl. viii., is the compressed remains just mentioned of part of a long narrow leaf or stem, cracked into fragments, with a tuberous root at the end. Length of specimen $4\frac{3}{4}$ inches, breadth $\frac{1}{12}$ inch; structure fibrous, parallel, longitudinal. *Loc.* brown shale.

Obs.—Three or four specimens of this stem or leaf were found together, but only one with the remains of the root. They are very common, and their cracked state, as well as the cracks which are seen

in the flat grey portions of the parenchymatous structure in these remains generally, seems to throw some light on the origin of the infinitude of small formless fragments which pervade these strata, viz. that while the plants from which they were derived were undergoing decomposition, either at the margin or the bottom of the fresh water in which they were deposited, these cracks took place, and, when there was no superincumbent material to keep them in their original position, they floated off, or were otherwise scattered about, and at length finally became stationary in the places where they are now found.

Fig. 7, Pl. viii.—This is a carbonized impression of a scaly leaf or stem in the black shale. It is very thin, and presents elliptical scales, which have their long axes longitudinally; also the transverse cracks to which I have just alluded. Specimen about $4\frac{1}{2}$ inches broad, and 1 foot long. The scale, (Fig. 7, *a*,) or division, consists of an arched elliptical projection, $\frac{17}{24}$ inch long, and $\frac{7}{16}$ inch broad. It is striated longitudinally, and seems to be surrounded with a very narrow flat rim or base, by which it is united to that of the adjoining scales. *Loc.* black argillo-carboniferous shale, in the intruded igneous rock.

Obs.—Only one specimen of this kind has been met with: it was discovered by Dr. Leith, and presents a thin layer of sparkling coal on its surface.

There are many other fragmental impressions of flat long leaves, both large and small, (Fig. 8, Pl. viii.,) with longitudinal striæ more or less perceptible on them, and more or less coal-bearing, in the black argillo-carboniferous shale or deposit; also impressions of large and small cordate leaves, and an imperfect impression (Fig. 9, Pl. viii.) of two lanceolate leaves, like those of the bamboo, except that they appear to be opposite instead of alternate. Dr. Leith, to whom I am indebted for most of these specimens, also sent me an impression (No. 10, Pl. viii.) closely resembling the stem and flower or seed of a cyperaceous plant, something like *scirpus lacustris*.

In no instance, to my knowledge, has the impression of any fern been discovered, though I thought at one time I had found the *sorus* of one, which afterwards fell off the specimen, and was thus lost. This was in a portion of the upper light brown-colored shale, from the tank north of the Horticultural Gardens.

Seeds and Seed-pods.

Fig. 11, Pl. ix., is a small flat capsule, circular, or horse-shoe shaped, with a pedicle rising in the centre, and passing off by the incomplete

portion of the ring. It presents a single row of seeds, arranged round the circumference of the disk. Diameter $\frac{1}{10}$ inch. *Loc.* light brown shale.

Obs.—These little discoidal bodies, looking like the magnified ringed capsules of a fern, are not uncommon among the accumulated fragments of vegetable remains in the upper part of the fresh-water strata.

Fig. 12, Pl. ix.—This seed, like that of *Artabotrys odoratissimus*, presents the ruminated appearance of the albumen peculiar to the natural order Anonaceæ. Length $\frac{12}{24}$ inch, and breadth $\frac{8}{24}$ inch; compressed, elliptical, and slightly pointed at one end. The ruminated albumen is in transverse lines across the seed, and in radiating ones towards the circumference of the round end. *Loc.* upper brown shale.

Obs.—This specimen was found by Dr. Leith, who pointed out its analogy to the seed mentioned.

Fig. 13, Pl. ix., is a siliquose pod; length $3\frac{1}{4}$ inches, and breadth $\frac{8}{12}$ inch. It is long, sub-round, slightly enlarged towards the apex, which is also round; narrowed towards the stem. *Loc.* black argillo-carbonaceous shale.

Obs.—Close to it lay two other apparently one-seeded pods, of the same description.

Fig. 14, Pl. ix., is another siliquose pod, broken off towards the stem. Length of specimen 3 inches, breadth $\frac{3}{4}$ inch. Long, lanceolate, narrowing a little backwards; angular laterally, presenting a ridge on each side, not opposite; slightly concave on each side the lateral ridge; flat along the sutures. *Loc.* black argillo-carbonaceous shale.

Obs.—For both of these specimens, as well as others of the same kind, I am indebted to Dr. Leith: a vertical section, parallel to the line of suture, has been made in one, but it fails to show anything definite in the interior.

There are a great number of large seed-like bodies throughout the whole of these strata, particularly in their lower part; but they are two undefined to admit of description.

No Gyrogonites have yet been met with.

Insecta.

Fig. 15, Pl. ix.—*Cypris semi-marginata.* (H. J. C.)—Length $\frac{22}{400}$ inch, breadth $\frac{14}{400}$ inch. Ovoid, sub-reniform, compressed laterally at the small end, dilated laterally at the large one; presenting a wide rim round the margin of the valves at the large end, which gives the cast an expanded appearance. This rim is obliquely striated externally, the striæ

passing from the convex or posterior border of the shell downwards and forwards. *Loc.* throughout the whole of the fresh-water strata.

Obs.—The obliquely striated rim round the large end of this fossil was pointed out to me by Dr. Leith; and since that I have observed that the prolongation of the valve in this direction is common to the few recent specimens I have yet met with in Bombay. It is likewise striated in them, but the striæ are short, and radiate from the circumference of the valve, instead of passing off obliquely from it, as in the present instance. Neither is the prolongation of the shell in this direction so wide, nor does it extend so much round the valve in the recent as in the fossil specimens. If we look into the interior of the valves of the former, (Figs. 18, 19, 20, Pl. ix.,) we shall see that the inner margin of the border is extended inwards more or less all round the valve, but more particularly at either end, and, of the two, most at the larger or posterior end, where there is left between it and the outer margin a thin lunate expansion. Beyond this comes a prolongation of, or appendix to the valve, in which there is a lunate fossa, or depression, separated from the general cavity of the shell; and this appears to be the portion which is so extensively developed in the fossil species under consideration, on the back or outer side of which are the oblique striæ mentioned. The segment enclosing the fossa or depression, however, in the recent species, instead of being one of a larger, is one of a smaller circle, while that of the fossil species is the contrary, the latter extending round the whole of the posterior or larger half of the shell, and expanding it dorso-ventrally. There does not appear to have been any papillæ on the surface of this fossil species, as is the case with most recent cyprides, but these may have been very minute, and may have disappeared during fossilization, or have been rendered imperceptible by the opacity of the object. I have named this species *Cypris semi-marginata,* from the character which I have just described.

Fig. 16, Pl. ix.—*Cypris cylindrica?* (Sow.)—Length $\frac{25}{400}$ inch; and breadth $\frac{11}{400}$ inch, sparsely papillated. *Loc.* lower part of undisturbed shale, among the frogs' bones.

Obs.—This appears to be *Cypris cylindrica,* which is also found in the chertified lacustrine deposits of the basaltic district of India. (See Malcolmson's Fossils of the Eastern Portion of the Great Basaltic District of India. Geol. Trans. 2nd Series, 4to, vol. iv. Pl. xlvii., fig. 2.) It is a little more than twice as long as it is broad.

Fig. 17, Pl. ix.—*Cypris* ———? Length $\frac{19}{400}$ inch, and breadth $\frac{12}{400}$ inch. *Loc.* upper part of fresh-water strata.

Obs.—Of this specimen I have never seen the shell, but an appearance in the mould, as if its surface had been closely and minutely papillated. It is distinguished from the cast of *Cypris semi-marginata* by not having the impression of the rim mentioned, and is therefore not so expanded dorso-ventrally; nor is it so prominent transversely, towards the large end, as *Cypris semi-marginata.*

The three fossil cyprides above described swarm throughout the fresh-water formation. I have already stated that within three inches of the overlying basalt there is a stratum of their casts three inches thick, not of one valve only, but of the whole shell, and the probability that this was occasioned by some sudden alteration of the water in which they lived. When most abundant, their shells are found in thin layers, which, being frequently separated from each other, would seem to point out that they had been deposited in great numbers at particular periods. In the upper part of the strata they are always more or less mixed up with small remnants of vegetable matter, while lower down the fossil skeletons of frogs are sometimes found upon the flat surface of the black carbonaceous shale on which they have been deposited. They are also found abundantly throughout the woody deposits, and entire in the interior of the roots and stems mentioned; in short, as I have stated, they almost swarm throughout the whole of this formation.

They would appear to have their corresponding forms in the three most common cyprides now found in the fresh-water accumulations of Bombay to which I have just referred, but the latter are much larger, as will be seen by comparing their relative sizes in the drawings, all of which have been delineated upon the same scale. Fig. 18 is sub-globular, tetraedral; prominent laterally; flat ventrally; sub-pyramidal dorsally; covered with minute papillæ, supporting short spines or hairs. Length $\frac{30}{400}$ inch, breadth $\frac{22}{400}$ inch. Fig. 19 is elongated; cylindrical; slightly incurvated ventrally; sparsely covered with large, and thickly beset with minute papillæ. Length $\frac{36}{400}$ inch, breadth $\frac{15}{400}$ inch. In both these specimens the borders of the valves present a substriated or milled appearance, particularly over the prolonged portion of the posterior or large end. Fig. 20 is sub-reniform, and covered with large papillæ, almost touching each other. Length $\frac{26}{400}$ inch, breadth $\frac{14}{400}$ inch. This has also the prolongation of the valve posteriorly.

Fig. 21, Pl. ix., is the right wing of a small coleopterous insect, one of two specimens found by Dr. Leith. It is $\frac{1}{10}$ inch long, and

presents parallel longitudinal ridges, with rows of puncta along their course, and transverse wavy lines across the ridges. *Loc.* black shale.

Obs.—This fossil is carbonized, and under it was found a layer of calc-spar, apparently the remains of the transparent wing; beneath which again were the ridged impressions of the under part of the elytra.

Fig. 22, Pl. ix.—This is the remains of a shell like *Melania*, which was conical, elongated, composed of five whorls, the latter costated transversely. Length $\frac{1}{44}$ inch, and breadth $\frac{5}{77}$ inch; total length of the impression $\frac{1}{44}$ inch; the additional length does not appear to have been caused by a part of the shell, though by something belonging to it. *Loc.* black shale.

Obs.—The specimens of this fossil are very indistinct, and formed of the same material as the black carboniferous shale in which they are imbedded. There are other impressions of a smaller shell of the same kind, but with a rounded apex, like that of *Pupa*: all were found by Dr. Leith.

In the chert of the upper strata, containing an abundance of cypridés, with fragments of plants, the section of a roundish shell, something like *Paludina*, was found.

Reptiles.

Rana pusilla.—This is the name which has been given by Professor Owen to the fossilized remains of the skeletons of the frogs to which I have had occasion to allude. The following is Professor Owen's description of them, which will be found in the Quart. Jl. Geol. Soc., vol. iii., p. 224, taken from specimens given to Mr. Clarke by Dr. Leith, who was the first person that discovered them :—

"The portions of shale transmitted by Mr. Clarke contain delicate, but for the most part distinct, traces of the generally entire skeleton of small anourous *Batrachia;* the osseous substance is black, as if charred.

"The number of vertebræ, atlas and sacrum inclusive, is nine; the caudal vertebræ are fused into a long, slender cylindrical style, as in most anourous *Batrachia.*

"In the specimen (Fig. 1) which lies on its back, the posterior convexity of the vertebral bodies is shown.

"The short, sub-cylindrical, and very slightly expanded lateral or transverse process of the sacrum, and the absence of ribs or their rudiments in the dorsal vertebræ, with the proportional expanse of the skull and length of the hind legs, show the specimens to belong to the family of Frogs *(Ranidæ).*

18

19

20

15

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17

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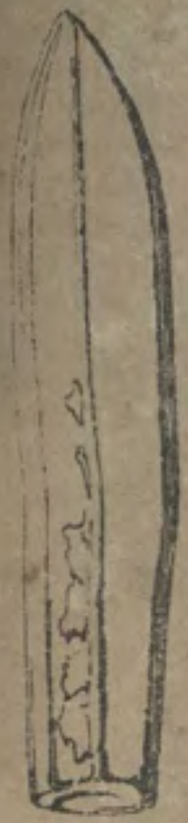
11

Nat. size.

12

Nat. size.

13



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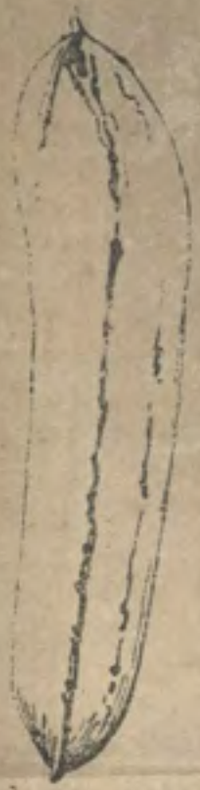

Testudo Leithii. (H.I.C.).

"There are seven abdominal vertebræ, with long and sub-equal transverse processes, that of the second (third vertebræ including the atlas,) being the longest. The humerus is cylindrical, not expanded, as in *Cystignathus*. The head is a little larger relatively than in *Rana temporaria*, *Rana esculenta*, or *Hyla viridis*; and still larger therefore than in the Toads and Natterjacks, *(Bufonidæ,)* or than in the *Pipa*; the expansion of the sacrum removes the genus *Pipa* and the *Bombinatores* from that of the present fossils. The following are admeasurements of the more perfect specimens:—

	Inches.	Lines.
Length from front part of head to symphysis. pubis.	0	6½
„ of the head	0	2¾
„ of the dorsal vertebral series	0	2¾
„ of os innominatum	0	2½
„ of femur	0	2¾
„ of anchylosed tibia and fibula	0	2¾
„ of tarsus	0	1¼
„ of whole foot	0	4½
„ of whole anterior limb	0	4

"All the specimens belong to individuals which had completed their metamorphosis, and they are similar to one another in size; they may have belonged either to a not quite full-grown brood, or to an unusually small species, of *Rana*.

"They conform in all respects as closely to the typical organization of the Frogs of the present day, as do the fossils discovered by Goldfuss in the tertiary lignites of the Siebengebirge, and referred by him to *Rana diluviana*; but the Bombay batracholites differ not only in their smaller size, but also in their proportionally larger skulls."

In most of these skeletons the teeth may be seen, and the bones are found (as Professor Owen has stated) in a charred state, in the black shale, which at the Sluices exists in separate layers, towards the lower part of the undisturbed portion of the fresh-water formation. They have not, however, yet been found *in situ*; but their position is inferred from the character of the shale in which they are imbedded. Generally the skeleton is entire, with the extremities more or less flexed, as they would be in a dead frog; and they lie flat on the black mud on which they have been deposited, alone, or amidst layers of cyprides. They abound at the Sluices, and in black shale excavated from wells on Malabar Hill, three miles off; and appear to be confined to the part of the fresh-water deposits mentioned; but are there found in different layers. In one specimen of black shale, which is $\frac{1}{17}$ inch thick, and

composed of six layers, they appear on every layer; in another specimen, belonging to Dr. Leith, they are on layers an inch apart, a deposit of brown shale half an inch broad intervening between the black carboniferous layers; and, in one instance, in and around a disturbed and broken up portion of black shale, I have met with their bones scattered with *cypris cylindrica*, in the heterogeneous-looking argillaceous deposit, probably of igneous origin, intercallating and surrounding that shale; while in the unbroken part of the shale itself the skeletons are entire, and the disposition of the bones the same as that in parts where they have been undisturbed. That the enveloping material here is of igneous origin is proved by its bluish or greenish-grey color, its heterogeneous-looking appearance, its argillaceous nature, its massive and unstratified form, and effervescence with acids. Hence it seems probable that in breaking up the black shale it swept off the loose bones of the skeletons, and carried them into the positions mentioned. Had it been otherwise, viz. that the igneous matter had flowed into the fresh water, and killed these animals, then there would have been no broken up black shale present, with the undisturbed skeletons entire in it; for the former would have overflowed the latter, and not have intercallated it. But this will be better understood when we come to consider the igneous effusion which has intruded these strata.

Testudo Leithii. (H. J. C.)—(Plates x. and xi.)—The remains of nine specimens of this tortoise have been found by Dr. Leith, and the following description has been taken from them:—

Carapace. (Pl. x.)—The 1st dorsal plate is pentagonal, almost quadrilateral, with two irregular sides in front, meeting at an extremely open angle, and behind a border slightly concave anteriorly; its lateral boundaries are rectilinear and divergent. 2nd dorsal plate about twice the size of the first; hexagonal; half as broad again transversely as it is antero-posteriorly; posterior border suddenly convex forwards in the centre, and longer than the anterior border; lateral borders undulous, and meeting at an obtuse angle outwardly. 3rd dorsal plate one-tenth less than the second; hexagonal; nearly twice as broad transversely as it is antero-posteriorly; posterior border abruptly convex forwards in the centre; much less in length than the anterior border; anterior lateral sides convex outwards; posterior lateral sides convex inwards, both meeting at an obtuse angle laterally. 4th dorsal plate a little more than half the size of the third; hexagonal; contracted posteriorly; posterior border straight; antero-lateral sides also straight, and short; postero-lateral convex outwards, both meeting

in an obtuse angle. 5th, or last dorsal plate, heptagonal, triangular, with the apex truncated; contracted in front; presenting posteriorly four sides, which unite with the two supra-caudal, and half the two first femoro-marginal scales; lateral sides rectilinear.

Antero-costal plate tetragonal, sub-triangular. 2nd costal pentagonal, its two inner sides forming an obtuse angle upwards. 3rd costal quadrilateral. The last pair of the costal ranges are broader above than below, and present six sides, by the three smaller of which they articulate with the marginal plates which correspond to them.

Marginal scales 24. Marginal collar and first brachials sub-quadrilateral, longer than broad; second brachial pair trapezoidal; supra-caudal sub-square, trapezoid; first and third margino-femoral pairs pentagonal, the latter longer than broad; the intervening ones square; fifth margino-lateral oblong, broader behind than in front. Of the other margino-lateral scales there are no specimens.

Plastron. (Pl. xi.)—Plane, elliptical; round anteriorly, and notched in the centre posteriorly, but not deeply; intergular plate four times larger than the gular, and pentagonal, sub-triangular, the two posterior sides meeting at an obtuse angle; gular plates resemble isosceles triangles, with their posterior edges a little bent outwards, towards the apex. These three anterior plates are locked in between the brachials, which resemble scalene triangles; they are not so large as the intergular plate. The portions of the pectorals and abdominals which cover the sternum present square figures. The femorals are quadrilateral, having their internal lateral border less than their external lateral one, which is slightly convex on the outer side. The anal plates are triangular and rounded exteriorly, and cover that part of the sternum to which the pelvis is soldered. (See plate.)

Where the axillary and inguinal scales might have existed the parts are imperfect, but there do not appear to have been any.

The head appears to have been triangular and flattened, unless this arises partly from pressure, and the nostrils obtuse; there is a deep gutter extending from the muzzle backwards, becoming superficial as it approaches the superior occipital bone. The orbits themselves are directed upwards.

The pelvis is soldered in front to the sternum, and the tail appears to have been so short that it only just extended beyond the ilia. Fortunately the point of it remains in one specimen in that position.

Dimensions.—Length of carapace $7\frac{1}{4}$ inches, breadth in its flattened state 6 inches. Length of plastron 7 inches; breadth at inguinal angles about $2\frac{7}{8}$ inches, and breadth in the centre about $4\frac{3}{8}$ inches.

Head.—From the nasal extremity of the anterior frontals to the basilar bone 1 $\frac{9}{17}$ inch; distance between the posterior angles of the orbits $\frac{11}{17}$ inch; distance between the anterior angles of the orbits $\frac{3}{17}$ inch; distance between the posterior angle of the orbits and the extremity of the mastoid process, which is prolonged blackwards, 1 $\frac{5}{17}$ inch; width between the condyles of lower jaw 1$\frac{1}{2}$ inch. *Loc.* The remains of these tortoises were found in the shale excavated from the undisturbed part of the fresh-water formation at the Sluices. Dr. Leith, however, is under the impression that one of the specimens came from a pit in the eastern side of the Flats just opposite. They have not been found *in situ*, but appear to have come from the middle of the undisturbed strata.

Obs.—Thus, it will be seen, from the pelvis being soldered to the plastron, that this tortoise belonged to the *pleuroderal elodians* of Dumeril and Bibron, none of which are now found in Asia; and from the absence of the nuchal plate, that it belonged to one of their first five genera. Also from the form of its scales generally, as well as the shortness of the tail, that it came nearest to the genus called *Sternotherus*, and of the species of this genus nearest, in the form of its scales, to *S. castaneus*. (Dumeril et Bibron Erpétologie Générale, vol. ii. p. 401.) It differs, however, from the latter species in the anterior lines of the pectoral scales of the plastron being parallel with those of the abdominal scales, instead of meeting at an angle backwards. In size it agrees exactly with the length of the carapace of *Sternotherus niger;* the plastron is also very nearly as large as the carapace. In the specimen from which the drawing has been chiefly taken, the plastron has been probably pushed forwards out of its original position, by the pressure to which these parts have been subjected during fossilization: in all the specimens both carapace and plastron are in contact. The horny parts of both, marked externally with their intricate network of grooves, as well as the outer layers of the bones themselves, are all charred, while the cancellous structure of the internal parts, being filled with calc-spar, presents its original appearance. Above are described all the parts of this tortoise which admit of it: the remains of nine individuals, as before stated, have been found, all very nearly of the same size, and all by Dr. Leith, after whom I have named it, and to whose rare attainments and acute perception we are indebted, not only for bringing to light the existence of the remains of this animal in the fresh-water strata of Bombay, but for almost every other valuable specimen that has been obtained from them, thus claiming, in fact, the merit of having first directed the attention of the public to this interesting formation.

Having described the upper strata of the fresh-water formation where they are best seen, and a few of the fossils which have been found in them, let us now trace them throughout the other parts of the island. I have already stated that they are overlain by the basalto-dioritic tract, and that this tract in the first instance was probably continuous all over the island, but that it has since been broken up into the ridges already described, and much of the parts which intervened carried away by denudation. Hence, it may be conceived, that the same agent which threw up these ridges also threw up at the same time more or less of the fresh-water strata which lay beneath them, and that therefore the latter will be found to be exposed on the scarped sides of, as well as in the plains between, these ridges, where the basalto-dioritic tract has been uplifted or removed. That such are the facts will presently become evident.

Beginning with the ridge on the outer side of the island, called Malabar Hill, we naturally look, in its scarped or eastern side, for the strata in question, and there we find them overlaid by the basalt, which in some parts is 50 feet thick; while they are completely hid on the other, or western side, where the basalt, which at first slopes suddenly over them, afterwards, as before stated, extends outwards into the sea at a very small angle of inclination. If we commence, then, from Malabar Point, which has been stated to be the southern extremity of the outer ridge of the island, we shall perceive these strata on its eastern side appearing just above the water's edge about 50 yards in: they are easily distinguished by their light brown or fawn color, which contrasts strongly with the black basalt above them. Following them northwards, we find that they gradually increase in thickness as the ridge rises; but after two-thirds of a mile suddenly become contorted and twisted into all kinds of shapes, indicating that at this part, which extends for about 300 yards, they have undergone more disturbance than at any other, and a short search shows us that it has been caused by the intrusion of an igneous rock. It was from the contents of a well excavated at this spot that the specimen of black shale and igneous matter, containing the bones of the frogs in a scattered state, was obtained. After this disturbed portion, the strata again resume their parallelism, and may be traced along the whole of the eastern side of Malabar Hill to Mahaluximee, where there is a break in the ridge of 1000 yards, extending from the place last mentioned to Lovegrove Point or Mama Hajanee, from whence the ridge is again continued on to the Sluices, where there is a second break, about 250 yards wide, and where the cut of the Sluices, which extends from the Flats to the sea,

exposes the section from which the foregoing description of this formation has been chiefly taken; and from which the principal part of the fossils mentioned have been derived. From this break on to Worlee Fort, or the northern extremity of the outer ridge, the fresh-water strata may be again traced, cropping out from the scarped portion of the basalt, and at the latter place may again be seen to be intruded by igneous matter.

Throughout the whole of this ridge they present an anticlinal elevation, one side of which dips more or less to the west, the other to the east, becoming almost horizontal again at the base of the ridge, where they extend, concealed under the basalt, into the sea on one side, and, exposed, over the Flats on the other. At the Sluices the dip of most of the strata on the west side of the anticlinal axis is more than 45°, and on the east side would appear to be the same, but is obscured by the Sluices; while the intruded igneous matter is seen filling up the angle of the arch thus formed, as if it had been the disturbing agent.

We now come to the Flats, and here the fresh-water strata are not continuous any more than the basalto-dioritic tract, both having, apparently, been broken up together, and suffered a like denudation: it is only here and there that a portion of the fresh-water strata is seen entire, being for the most part mixed up with intruded igneous matter, or entirely transformed by decomposition; but, on passing across the Flats, we again find them here and there, overlaid by the diorite, and hence we may expect to find them exposed again in the scarp of the eastern ridge in a similar manner to that we have seen on the western ridge, for, tracing them where they are yet entire on the eastern side of the Flats, viz. at the end of the Grant Road, we find them 600 yards further due east, viz. in Baboola Tank, underlying the diorite, as before stated; and again, 650 yards still further, in the scarp of the quarry on the eastern side of Nowrojee Hill, but here in a thin line, either on account of the intruded igneous rock having merely separated a foot or two of the upper part of this formation from the rest, or from the pressure of the incumbent basalto-dioritic tract, which is here very thick. In Baboola Tank these strata, which are only five feet thick, are seen to have only four feet of diorite left above them, while in Nowrojee's quarry they have 90 feet. Again, after tracing this formation across the Flats opposite Parell to the eastern side of Parell Tank, we find its strata appearing in the wells there, also, with only a few feet of diorite above them; and, if we cross over the hill, we shall find them cropping out again on its eastern side. Thus they are seen to pass across the Flats, and to appear again on the scarped side of the eastern ridge,

proving that they have been everywhere superposed by the basalto-dioritic tract.

Let us now go to the scarp of the eastern ridge, and follow these strata northwards, from Nowrojee's quarry, where, as before stated, they are reduced to a thin line. For some distance after this the state of the hills, from being covered more or less with grass, does not permit of our seeing them satisfactorily, but when we come to the southern extremity of Chinchpoogly Hill, the thin stratum, composed of the casts of cyprides, with fragments of plants, which I have before stated to mark the upper boundary of this deposit, is again recognized, immediately underlying the diorite, and not more than 30 feet above high-water mark. This stratum, in a broken, black, basaltified state, may thence be traced for 900 yards, rising all the way, until it is elevated by a subsequent igneous effusion to the crest of the hill itself. From this, we may trace these strata on to Parell Flag-staff Hill, and thence to a tank beyond the Gardens, where they exist in very thin layers, making in all 16 feet thick; wavy from disturbance, and dipping, as usual, greatly towards the west. They are here richly charged with fragments of plants, and the casts of cyprides, but do not present a single black carboniferous lamina; although immediately on the other side of the ridge opposite Parell Tank there are portions of interlaminating black bitumenous shale which have been excavated from the wells there, just like those which are obtained from the wells at Malabar Hill and the Sluices, in which the frog-skeletons are found.

From the former tank the fresh-water strata are continued northwards through a valley, over an area of upwards of a mile long, and from two to three hundred yards broad, uncovered by the diorite, as in the Flats, and forming a horizontal plain between the first and third eastern ridges, already described, until they reach the village of Nagaum, on the road to Sion, where they join the strata on the Flats, and the main ridge of diorite is for a certain distance reduced almost to a few boulders.

This formation may again be seen in the valley between Kandlee Battery and Jackaryah's Bunder, that is between the second and third eastern ridges, passing up to the tank at north of the Gardens, and in its way exposed in a large excavation to the depth of 16 feet, dipping, as usual, towards the west. Lastly, this formation may be seen again on the eastern side of the third ridge, extending northwards from Jackaryah's Bunder, more or less broken up, to Sion, at the northern end of the island.

From what has been stated, then, two facts are now evident, viz., that there is a fresh-water formation, and that it is partly overlaid by a

basalto-diorite tract, which was once continuous, and probably horizontal. After this, a third fact becomes evident, viz. that there must have been some subsequent cause to throw up these two formations, at first parallel to each other, into their present ridges. The consideration of this cause brings us to the description of the intruded igneous matter, or second effusion.

Second Effusion.—I have already alluded to the presence of igneous rock among the contorted strata, a short distance in from Malabar Point; that it is seen again at the cut of the Sluices, and again at Worlee, the northern extremity of this ridge; also in different parts of the Flats, &c. But as yet I have designated this effusion by no particular name; and when we remember that it has flown in between the aqueous strata, breaking them up into fragments, bruising them into powder, and more or less amalgamating with them, we cannot wonder that in one place this effusion should have assumed one form and in another another, depending upon the quantity of foreign material with which it has become mixed. Hence it will be necessary to go to that place, or places, where it is most pure, first, and ascertain its original character. For this purpose, let us begin with it at Nowrojee Hill, where it is 40 feet thick, and apparently as pure as when it first came from the volcano. Here it underlies the thin line of fresh-water strata mentioned, and in the form of trappite; differing so little from the diorite above, that until we compare the two together, the points of difference do not appear. When, however, this is done, we observe in the trappite that there is a great addition of blue argillaceous earth to the binary compound of felspar and hornblende of the diorite; also that the former is of a darker blue color, more earthy in structure, and more soft and yielding to the hammer; the color and breaking of this rock alone will enable the experienced observer while in the quarry to say directly from what part it came, still to the ordinary observer the two are one and the same. This is the state of this effusion, I presume, where it is seen intercallating the aqueous strata below Dr. Buist's house, or nearly opposite Sewree, but the part exposed there is decomposing into spheroids, and too far advanced to satisfactorily exhibit by fracture its original state. In Baboola Tank, and at the tank north of the Horticultural Gardens, it is an amygdaloid aphanite, with a greenish colored base, the cavities being filled with laumonite, which is surrounded by green-earth, and which substance in many places seems to become a pseudomorph of laumonite. On the Chinchpoogly part of the eastern ridge, just behind the house called Lowjee Castle, where there has been an outburst of a still later effusion, the cavities of the former, which

is decomposed where it remains on the upper side of the latter, are partially or wholly filled with quartz crystals; large crystals of hyalin and amethystine quartz from crushed geodes are also seen in it; while on the lower side of the dyke the cavities of the amygdaloid are filled with green-earth in a fresh green, and decomposing brown, rock. They are also filled with quartz in the neighbourhood of Sindu Para; in an area of about half a mile square, on the western side of Ghorpadevi, towards the Flats, where the rock is brown colored; and, further north again, with green-earth, that is to say in the neighbourhood of the house called Lowjee Castle. On the eastern part of the Flats, nearly opposite Parell, the cells are filled with calc-spar, and for several feet down the rock is a brown spilite, (base aphanite, filled with crystals of calc-spar,) imbedding pieces of the aqueous strata towards the surface, which become less downwards, and the rock, becoming blue, at length passes into trappite. In some parts this rock is veined with calc-spar, and in others presents geodes or large cavities, filled with large lenticular crystals of the same, resting on their edges. Still further north, again, at Dharavee, this effusion is of a light yellow or fawn color, and is commonly called "White Trap." There is a large tract of it here, and in many parts, where it is amgydaloidal, the cavities are filled with a soft fine white clay, like white green-earth, which seems to be an ultimate pseudomorph of laumonite here. In the museum of the Asiatic Society there is a radiated mass of scolezite, passing into a fine flesh-colored greasy pseudomorph, very like pagodite; and also several massive varieties, which have lost their crystalline appearance, and have assumed a compact structure, which is opaque, white, and greasy to the nail; so that this passage of a zeolitic mineral into fine soft clay seems not to be uncommon. Crossing to the western ridge of the island, we have this effusion, as before stated, amidst the aqueous strata, apparently possessing all the ingredients of the blue trappite seen in the quarry at Nowrojee Hill, but without the semi-crystalline structure. The blue earth is evident, but the rest of the ingredients have taken on an earthy, argillaceous state, and have become more or less impregnated with calc-spar, which causes this rock to effervesce when touched with nitric acid. From the wells on Malabar Point it comes out partly in the form of a clay rock of uniform fine structure, and blue color, still effervescing with nitric acid. In some portions of this there are small angular fragments of a white color, which seem to be parts of the fresh-water strata, and thus identify this breccia with an effusion which by-and-bye we shall find widely spread on the other side of the island. At Worlee, where this rock is exposed, it is of a bright red brick color, and filled

with fragments of the preceding formation; and at the Sluices it is of a bluish color, and envelopes large masses of carboniferous shale, besides being impregnated throughout with a naphthous odour; while between these two places it is found in a decomposed amygdaloidal state. Where it appears on the sea shore, at Malabar Hill, pieces of open scoriæ are imbedded in it—the only instances of the kind I have met with in the island of Bombay. At the cut in the Sluices the rock is seen filling the internal angle of the anticlinal elevation of the aqueous strata; appearing, as before stated, to have been the agent by which the whole of this ridge has been elevated. It is seen in many parts of the Flats much in the same state as in the western ridge, having, in short, intercallated and broken up the fresh-water strata more or less throughout the island. North of a line extending from Parell to Worlee the whole of the Flats under the clay is covered with the thin stratum, composed of the casts of cyprides, which has been chertified, and rendered more or less jaspideous by heat; thus affording a serviceable material for forming the surface of the railway in this part of the island.

Hence we have seen, that the second effusion in its purest form at Nowrojee Hill is a trappite, and that this trappite passes into aphanite, —the latter may be seen taking place within a few yards, in some small tanks and excavations on the eastern side of the railroad, towards the middle of the island. We have also seen the trappite in other places passing into an amygdaloid, the cavities of which are filled either with laumonite, quartz, green-earth, calc-spar, or fine white clay, (decomposed laumonite?) according to the locality; also that in some places it contains more or less fragments of the aqueous strata; is sometimes a blue compact hard clay; sometimes a breccia; and, last of all, that it may have an earthy or semi-crystalline base, colored blue, green, brown, yellow, or red.

We do not see the trappite or amygdaloid form of this effusion anywhere breaking through the basalto-dioritic tract; at the same time we see it interlaminating to an extreme degree the fresh-water strata; from which it may be inferred that it was thrown out under a great weight, and that this superincumbent weight was the basalto-dioritic tract. But for this extreme interlamination, it might have been doubtful whether it had not been thrown out while yet the aqueous strata were in process of being deposited, and that there was then an interval again, during which more aqueous strata were deposited; and, last of all, the basalto-dioritic tract poured forth over the whole. It is, however, almost impossible that in such loose soft strata as those composing

the fresh-water formation, an interlaminating intrusion of the igneous rock should take place to such an extent as we see it, without the presence of a superincumbent weight, such as the basalto-dioritic tract must have formed; it would rather have burst through the whole of the thickness of these strata in the form of a great dyke, and then have overflowed them. On the other hand, its amygdaloid form chiefly distinguishes it from the basalt and diorite of the basalto-dioritic tract. The late Capt. Newbold has observed (Jl. As. Soc. Bengal, vol. xiv. p. 204) that in the Southern Mahrata Country, "both these rocks [old and new geeenstones] are distinguished mineralogically from the tertiary or overlying traps, by their rarely assuming an amygdaloid character, and their freedom from agates, opals, calcedonies, zeolites, green-earth, olivine, &c. so abundant in the latter."

Thus the third fact becomes evident, viz. that the second effusion was one cause, if not the first and principal, of the displacement of the fresh-water formation, and the basalto-dioritic tract.

Third Effusion.—We have now a fourth fact to establish, and that is the occurrence of a third volcanic effusion, by which the strata of the fresh-water formation and other rocks have been thoroughly broken up, and converted into a volcanic breccia, forming a large tract. This tract extends from Carnac Bunder to Sion Causeway, and forms the entire of the chain of hills bordering the north-eastern end of the island, from the Fort of Sewree to Sion, inclusive. It would be difficult to prove that it was a subsequent effusion to the last mentioned, were not large portions of both the basalto-dioritic tract and the amgydaloidal effusion mixed up with the fragments of the aqueous strata. But the presence of the amgydaloid alone, places this beyond a doubt.

Let us now trace this volcanic breccia throughout its whole extent; but, before doing so, it would be as well to premise that the igneous matter binding together its fragments is aphanitic, and for the most part of a white color, speckled with brown, but passes from blue, which is probably its original color, to green, yellow, brown, red, and, lastly, black, varying according to its compactness, and extent of decomposition. It is generally earthy, sometimes where decomposed sandy, and in some parts hard or wholly jaspideous.

Commencing from Carnac Bunder or its southern extremity, we find this effusion for the most part white, and extended over a large area, which is covered by the sea at high tides. Large fragments of the fresh-water formation are here seen imbedded in it, as well as fragments of the other rocks, some of the former six feet long, and still retaining their thinly laminated appearance, and so plentiful that the whole mass

assumes a dark color from their presence, but this will be found to be confined principally to the surface. Tracing this volcanic breccia northwards, we find it passing under Mazagon Hill, the base of which it forms; and the wells in it on the northern side, extending downward for 60 feet without passing through it, show how thick it is. Here, also, we see that the brecciated part is chiefly confined to the surface. The newly excavated contents of these wells also show that some way down this effusion is extremely white, like lime, but it is chiefly composed of silex: when I was examining them some people were taking portions away to white-wash their houses. In some parts also it is mottled blue and green, or red, and in structure is granulo-pastic. We now find it bordered on the eastern side by the second dioritic ridge, which probably overlies it; and in the neighbourhood of Tank Bunder its brecciated form appears in perfection. All the rocks of which it is composed are here seen in large masses, or in comminuted fragments, varying in size with the locality, and with the coarseness of the breccia; but what is most remarkable is its separation in some parts into polygonal or prismatic divisions, at once proving that it is of volcanic origin. From Tank Bunder it may be traced on to Chinchpoogly Hill, keeping principally to the shore, and thence to Jakaryah's Bunder, where it assumes the form of sand of a yellow color, imbedding large fragments of the aqueous strata in a red or black jaspideous state. From thence to under Dr. Buist's house, nearly opposite Sewree, it may be seen passing in between the less disturbed aqueous strata which here lie beneath the second effusion, and on arriving at Sewree itself we come to the tract of it which extends uninterruptedly to the northern end of the island, forming every hill and mound between Sewree and Sion; thus covering an area of about three and a half miles long, and in its broadest part three-quarters of a mile wide. It will surprise the observer at first to find that it assumes the appearance and structure of a coarse black homogeneous jasper at Sewree; but, if he examines this carefully, he will see in parts of it which are washed by the waves, large fragments of diorite and amygdaloid rock; and when he comes to approach Antop Hill from the west, which is still more homogeneous and jaspideous, he will find that he walks over the light-colored volcanic breccia first, and then over a blacker and blacker colored, until the fragments of stratified rock become mingled more and more with the igneous effusion, and at length disappear altogether, giving place to the homogeneous composition mentioned. It was here, in the plain between the village of Wadalla and Antop Hill, that Dr. Leith pointed out to me, in a semi-jaspideous group of black rocks, a large piece of

coarse-grained white crystalline diorite, looking at first sight like granite or syenite, also other portions of diorite, all of which are larger grained than any which is to be found on the surface of the island of Bombay. These, then, must have been brought up from a depth by the igneous effusion, and it may be questionable whether they are not portions of the rock on which the fresh-water formation rests. Striking as the gradual passage just mentioned of volcanic breccia from one state into another may appear, the sudden transition of the black jasper of Antop Hill into the light colored breccia of the one adjoining it is much more remarkable, for in the latter instance you may almost put one foot on one and the other foot on the other, though they belong to the same effusion. After Antop Hill all the others in this neighbourhood, some upwards of 130 feet high, are composed of a light reddish-colored breccia, compact externally, that is where it is not decomposing. In some parts the fragments composing it are all small, and in others large and small, but all sharply angular. Here and there, also, may be seen polygonal divisions on the surface, indicative of the prismatic form common to basaltic rocks. I am led to believe that this breccia forms a great part of the mountains in Salsette, and have seen it myself there forming those both of the northern and southern extremities of this island.

Let us now return to the neighbourhood of Mazagon, where the diorite remains continuous over a larger area than in any other part of the island; and here we shall find that almost all the wells pass through it into this white brecciated effusion. Where this is not the case, they are more or less veined or dyked with it, and in several places we may observe that it has broken through the diorite, and spread itself for a short distance over its surface, showing clearly that it must have been a subsequent effusion to the diorite at least. Indeed, when we come to consider that the diorite overlies the aqueous strata, we can easily conceive how it should be underlaid by the second and third igneous effusions, which have followed the course of these strata; but it is only the latter effusion which seems to have burst through the diorite.

We have now traced this effusion coming from under the base of the eastern ridges throughout its whole length; and we have seen it forming the plain and hills in the north-east part of the island; we have also seen it forming the lower part of the wells in the dioritic tract of Mazagon, and we have seen it veining and dyking, and at last bursting through this rock in the same locality; but we have still another place left to examine it, where it forms half the ridge between Chinchpoogly

and Parell Flag-staff Hill. Here it begins to issue 600 yards south of the latter from a dyke, which descends rapidly on the eastern side of the ridge, separated from the diorite above by about six feet of amygdaloid, belonging to the second effusion, to which I have already alluded, (page 192,) and below by the same amygdaloid, partly in a fresh and partly in a decomposed state. The volcanic breccia here is chiefly composed of the white powdery aphanite before mentioned, with brown specks, the former melting into a white porcelain globule with borax, the latter attracted by the magnet after exposure to heat. It contains but few fragments of the other rocks, and its chief peculiarity—that, indeed, which distinguishes it from all other effusions of the island—is that it is filled with cells which are elongated horizontally, as well as large and small geodes, which contain crystals of hyalin or amethystine quartz, calcedony, or agate. The geodes are for the most part compressed vertically, and some are a foot in length, and contain crystals an inch long, and proportionally thick; the rock is decomposing, and the cells and geodes, which have been filled by infiltrated agate or calcedony, are lying about the neighbourhood, affording a good example of the way in which the so-called agate and cornelian mines are formed. This rock, which issues at the point mentioned, is continued on, forming the eastern side *only* of the ridge for some distance, when it crosses it diagonally to attain the western declivity of Parell Flag-staff Hill, down which it extends for a short distance, and there ends. Just at this part the road from the Horticultural Gardens to Parell passes over it.

One observation only remains for me to state respecting this effusion, viz. there is a dyke of it seen passing up through the westernmost of the hills at Sion, through the base of which the railway has been cut, and by which its existence has been made evident. It contains portions of the fawn-colored amygdaloid of the second effusion, ("White Trap,") which, it will be remembered, exists close by in a large tract at the village of Dharavee. The cellular cavities of the fragments are also filled with the fine white greasy earth which I have stated to be a pseudomorph, if not a decomposed form, of laumonite. This dyke, which is 16 feet wide, and rises at an angle of 80°, is inclined towards the south, but, from the red color of the breccia through which it passes, it is fast becoming discolored, and in a short time will be undistinguishable on the surface from the rest of the rock. There is another dyke of it in a cut of the road towards Trombay, just on the other side of the Causeway, in the island of Salsette, which is two and a half feet wide: it has a nearly vertical direction, and passes between the diorite on one side and the red breccia on the other. These dykes, then,

constitute a *Fourth Effusion*, from their passing through the third effusion.

In all the effusions subsequent to the basalto-dioritic, calc-spar abounds more or less, which is not the case with the latter, in which it is rarely if ever seen. In the blue amygdaloid aphanite at Baboola Tank it is common in large cavities, with laumonite, occurring massive or in pyramidal crystals; and in a fragment of the fresh-water strata about a foot in thickness, and many yards square, which was cut through in sinking a well at the south-eastern corner of the tank, the calc-spar especially abounded in the cavities following the line of the stratum. This was the case, too, in a well which was excavated at Paidhonee, in the centre of the Native Town. Throughout the more brecciated portion of these effusions it is disseminated in small masses, or veins, or mixed up with the rock generally, and, indeed, wherever there are portions of the fresh-water strata present there is almost sure to be more or less calc-spar, though the former are essentially argillaceous; while the opposite is the case in the other parts of the igneous rock, which are not mixed up with the fresh-water strata. With the exception of a little pyrites here and there, calc-spar is the only accessory mineral worth mentioning in these effusions.

The compactness of the volcanic breccia varies very much: in some parts it is exceedingly hard and tough, as at Carnac and Tank Bunders, especially towards the surface, where the mass is in polygonal divisions; but towards the interior it becomes soft. In a well which was excavated into it through the dioritic ridge nearly opposite Sewree, it cut like cheese, and so similar in consistence was the whole, that but for the fresh smooth section I could not have distinguished the angular fragments. In other parts, again, where it is exposed, it is loose and sandy, but, from the presence of argil, always of sufficient consistence to keep together.

From the protean nature of these effusions, then, it is not unlikely that some of them should resemble the rock called *Laterite*, which is so widely spread throughout the basaltic district of Western India, and such is the case. It may not be uninteresting, then, to compare the two; but, before doing so, let us shortly review the opinions and descriptions that have been given respecting *laterite*, and for this purpose I shall quote largely from Mr. Cole's interesting paper on this rock, published in the Madras Journal of Literature and Science, vol. iv. 1836, p. 105.

Characters of Laterite.—Dr. Buchanan, (Gleanings of Science, May 1831,) who first described and named this formation, states that "it is

full of cavities and pores, and contains a very large quantity of iron, in the form of red and yellow ochres. In the mass, while excluded from the air, it is so soft that any iron instrument readily cuts it," but after exposure becomes "as hard as brick." He never observed any "animal or vegetable exuviæ" in it, but had heard of such having "been found immersed in its substance": it blackens externally on exposure, and is found universally overlying granite. Dr. Buchanan nowhere mentions its association with trappean rocks. But Dr. Christie (Mad. Jl. vol. iv. p. 468) states that "it is found resting in different situations, on granite, transition rocks, trap, and sandstone." We see it at Mahableshwar capping all the trappean mountains upwards of 100 feet thick, as well as I can remember, and giving them flat tops; and I am informed by Mr. N. A. Dalzell that in the cliffs on the Malabar Coast about Rutnagherry it may be seen even overlain by basalt.

Mr. B. Babington considered *laterite* to be composed of the detritus of syenitic rock, and to be alluvial, "formed from the washings of the Ghaut mountains." He states that "the hornblende uniformly decays into a red oxide, [of iron ?] and the felspar into porcelain earth"; that it forms rounded hills below the Ghauts; and, between Tellichery and Madras, he accounts for its cellular structure by the rain washing away its white parts, and leaving the red.

Dr. Voysey, who seems to have had the clearest conception on these matters of any Indian Geologist with whose writings I am acquainted, made the following statement in a letter to General Cullen, dated 5th November 1820, copy of which appears in Mr. Cole's paper:—"The indurated clay you mention is very probably the result of those muddy eruptions so common, and of such extensive occurrence, in South America. Indeed, I am convinced that the greenstone, [diorite ?] basalt, wacke, [aphanite ?] iron clay, or laterite, and the indurated clay, have all a common origin, from the insensible degrees by which they pass the one into the other; and they only differ as to the degree of pressure to which they have been subjected when under fusion."

Again he mentions, (Jl. As. Soc. Bengal, Aug. 1833, p. 400,) when alluding to the passage of basalt into wacken, [aphanite ?] and then into iron clay, [laterite ?] that the latter takes place "in the space of a few yards."

Dr. Christie *(loc. cit.)* calls the laterite of Buchanan a "clay-stone conglomerate," (pp. 462 and 468,) and states respecting its position in the district of Dharwar that it is found "principally in its western parts, and on the summits of the Ghauts."

Mr. Cole states of a specimen of laterite from Nellore, given him

by the late Dr. Malcolmson, that "it was filled with innumerable minute pebbles of quartz, rarely larger than half the size of a pea, sometimes pellucid, generally much rounded; together with yellow and ochraceous earths." These would seem to have been the miliary contents of an amygdaloid,—whether *in situ*, or in a decomposed or altered rock, or forming foreign substances in a subsequent effusion, I cannot pretend to decide, but I should think the former.

Mr. Cole also quotes Mr. Coulthard, (As. Res. vol. xviii.) whose observations appear to favor this supposition, viz. that "the iron clay" about the Sagar district, and which is easy to be met with everywhere there, "is for the most part amygdaloidal."

Lastly, Mr. Cole himself states of the "Red Hills" at Madras, in the banks (15 feet high) of the old channel, leading into what is termed the lake, that "They are composed of a dark ferruginous stone, arranged in a stratiform manner, presenting seams or partings, two or more feet asunder, parallel to each other, and nearly horizontal. Vertical fissures intersect the seams at right angles, and thus produce prismatic masses of rock." The rock is a "conglomerate," consisting of nodules of various sizes, imbedded in a "clayey paste," which is hard and tenaceous: they are "water-worn," but present a "considerable angularity of surface, yet still sufficiently rounded to indicate their having undergone attrition"; in size they range from "a filbert to masses a foot or more in diameter. Their fracture exhibits the structure of a coarse-grained sandstone, or grit, of a deep chocolate or claret hue." "Small masses of white earth-like lithomarge and mica are sparingly scattered in the sandstone nodules." On ascending the hill on the side of the lake, the conglomerate disappears, and changes into the more characteristic laterite, red and cavernous, with "tortuous cavities"; still, however, containing fragments of the sandstone, seemingly united "by the *debris* of the sandstone itself, of iron ores, and lithomargic earth." (Pp. 110 and 111, *op. cit.*)

How much, then, do all these descriptions approximate the subsequent effusions in the island of Bombay to *laterite!* The external surface of the hills at Sion, and the cuttings of the railway in them, show that they are composed of a red argillaceous and ferruginous base, filled with cavities, containing white or yellowish lithomargic earth, this lithomargic earth principally consisting of decomposed laumonite, or its pseudomorph in the form of white green-earth; the masses hard superficially, and soft or sectile internally; with more or less fragments of the fresh-water strata, diorite, and amygdaloidal rocks. Nor is it strange, if these subsequent effusions should be identical with the *laterite*, that in the latter should,

under certain circumstances, be organic remains; for in the former we have masses of black shale, as at the Sluices, consisting almost entirely of organic remains; and a hundred other instances might be adduced in the second and third effusions, where the organic remains are not only in masses of shale, but entirely isolated from it, and alone in the igneous rock,—to wit the scattered pieces of wood, &c. &c. found in it at the Sluices, and the frog-bones at Malabar Hill.

The late Captain Newbold has observed that at Pondicherry the *laterite* "occasionally possesses a distinctly stratified and conglomerate character, and passes into a loose coarse sandstone, imbedding silicified wood; and at Beejpoor, on the Malabar Coast, it passes into loose sandstone, imbedding layers of lignite": also that General Cullen had discovered "lignite and carbonized seeds in the laterite of Quilon and Travancore." (Jl. As. Soc. Bengal, vol. xiv. p. 299.)

And the following description of the rock, which forms the upper part of the hills in the "Rajmahal Coal Formation," about 130 miles N.W. of Calcutta—which would very nearly do for that of the subsequent effusions in the island of Bombay—is another illustration of it:—

"151. The higher ridges of these mountains consist of scoriform masses of red earthy vesicular conglomerate, (laterite,) containing angular and other fragments of altered coal-measure shales, ferruginous and micaceous sandstone, imbedded in a semi-vitrified and vesicular matrix. These ridges are without any signs of stratification, except where detached masses of altered coal formation occur; while the upper portion of their declivities, as well as all the lower and intermediate ridges, are composed either entirely of amygdaloidal trap, containing zeolites and calcedony, or altered coal-measure sandstone and shale, the latter passing into the small isolated patches of coal-measures which are found in some of the narrow valleys and ravines mentioned." (*Report of the Geological Survey of India, for the Season of* 1848-49, by J. M'Clelland, Surgeon, Bengal Service, p. 45.)

Thus we have the *lateritic* effusion—for such Dr. M'Clelland evidently conjectures that of the Rajmahal Mountains to be—at the three points of the great triangle, formed by Madras in the south, the Rajmahal Hills in the east, and the island of Bombay in the west.

Again, we may see at Dharavee, in Bombay, the light fawn-colored aphanitic rock, called "White Trap," and which I presume is equivalent to Dr. Voysey's wacke, decomposing, and passing, as he has described the latter, within a few yards, into a mottled white and red decomposing rock, with cellular cavities, filled with the soft greasy white clay

mentioned, thus confirming what this acute observer has so clearly stated in his letter to General Cullen, viz. "that the greenstone, [diorite?] basalt, wacke, [aphanite?] iron clay or laterite, and the indurated clay, have all a common origin"; and I need hardly now add that this is volcanic,—to illustrate which by analogy, I might state, that as a stream of water passing from a clear lake to the sea becomes discolored by the kind of detritus which it takes up on its way, still remaining pure at its source, so a volcanic stream, on its way to the earth's surface, may, from the nature of the rocks through which it passes, be converted into the various forms met with in the *laterite*. I do not mean to assert that such effusions are in the same state now as when they were first poured forth; for we know from every-day experience that the most compact rocks, like all other things, have but a stated time to go through their different phases; that a re-arrangement of particles is continually taking place in them; that some are carried away, and replaced by others; that others are carried away, and leave nothing but their empty cavities,—color, substance, form, all is sooner or later changed and dissipated. But in the volcanic matter which has become *laterite*, the presence of foreign material does seem to have curtailed to a certain degree its vitality, so to speak, and to have caused it to decay sooner than it otherwise would have done; and I think, when among the trappean rocks we do not observe the common forms of structure and colors peculiar to them, both in their compact and decomposing states, we may infer the presence of this foreign material, though it is not demonstrable to our senses. Why the *laterite* should be so impregnated with iron, and the red color so developed in it, seems not less inexplicable than that of the New Red Sandstone,—the Rothliegendes or Exeter Conglomerate of which it so closely resembles. Mr. Logan's hypothesis, that when the red color has extended into other rocks the agency of "volcanic steam, gases, or fluids charged with iron," may be called into account for their red disintegration, seems very tenable—that is where they have not enough iron in them otherwise. Indeed, his hypothesis throughout will be found hardly less applicable to the island of Singapore than it is to that of Bombay. (Jl. As. Soc. Bengal, vol. xvi. part 1, p. 534.)

The very genuine pieces of *laterite* only differ from the rock of the hills at Sion in being more ferriferous, and in presenting a cavernous structure, composed of sinuous instead of irregular spheroidal cavities; such differences bearing no comparison with those which exist between the red brecciated hills at Sion and the black jaspideous hills of Antop and Sewree, though they are both parts of the same formation.

Thus the subsequent effusions in Bombay would appear to be identical in origin, and almost so in structure and composition, with the *laterite,* though the latter has been stated not to come further north than the Bancote River, which is 60 miles south of Bombay. And it should be remembered that this breccia is not confined to the island of Bombay—that, indeed, we only have a specimen of it here; but that it forms the principal part of the mountains in Salsette, and may be seen at the northern extremity of that island, viz. at Ghora Bunder, which is 18 miles from Bombay, containing there, as in Bombay, large pieces of aqueous strata, apparently identical with those of the fresh-water formation in Bombay. How far further north or south it may extend is not yet known; but if the masses of aqueous strata in it be really indentical with the fresh-water ones of Bombay, their existence at Ghora Bunder not only proves that the volcanic breccia extends so far, but that the lake or river in which these fresh-water strata were deposited must have also extended this distance.

There is one fact more which I forgot to mention, and which is still further confirmatory of Dr. Voysey's opinion respecting the common origin of greenstone, basalt, wacke, and laterite, viz. that much of the third effusion or volcanic breccia, which I think we must now regard as *lateritic,* if not genuine *laterite,* is in the state of kaolin, and when pieces of it are well washed with a brush in water, they present, in like manner, the angular parts of the undecomposed grains, possessing the same greenish tint and appearance as those of the fine-grained diorite of the basalto-dioritic tract.

Having now gone over the *fresh-water formation;* the first effusion, or *basalto-dioritic;* the second, or *amygdaloidal* effusion; the third effusion, or *volcanic breccia,* and the *dykes* of the same, which constitute the fourth effusion,—indeed all the ancient formations,—let us now go to the modern ones, viz. those of the Pliocene Age, the geological age of the others being as yet undeterminable.

This modern series merely consists of the *clay* which fills up the central or lagoonal depression of the island, and the *shell-beaches* which overlay it in Back Bay, the neighbourhood of Mahim, and at Sewree.

Clay.—This is a stiff plastic deposit, of a fine uniform structure, not effervescing with acids: the color is brown above, blue below, and then yellowish, where it rests upon or mingles with the decomposing igneous rock, or the remains of the fresh-water strata. Its thickness of course varies with the irregularities of the igneous rock beneath, but it diminishes also gradually towards the sea, or where it passes under the shell-beaches. Thus, at the southern part of the island, within three

quarters of a mile of Back Bay, it is 10 feet thick; after this it diminishes in thickness towards the sea in Back Bay, and 600 yards from the latter, where it is yet overlaid by the shell-beach, it is only 4½ feet thick, and of a blue color: still nearer the sea it seems to disappear altogether, for it was not met with in a well 20 feet deep in the Girgaum Road, about 300 yards from it.

The same thinning out probably takes place under the shell-beach of Mahim, at the northern end of the island; but there I have not had the same opportunity of examining it.

This clay is also met with at Sewree, where Dr. Buist, who has paid much attention to the formation, pointed it out to me. There the sea is exposing it, and scarping the shell-beach which overlies it, by which one might infer that this portion of the island was undergoing elevation.

Like most argillaceous deposits, it contains very few organic remains: the shells are almost all confined to the beaches which overlap it—still here and there it does present a few scattered ones. At Sewree, at Mahim, and under the beach at Back Bay, it contains a good deal of wood, probably the stumps of mangrove trees, which originally grew in it. This wood seems to be chiefly confined to the parts mentioned, and presents a number of calcareous tubes, which are straight or undulous, and from a half to three quarters of an inch in diameter. They are more or less filled with calcareous infiltrations, and originally were formed round the borings of some pholadine animal. The wood itself is in a spongy expanded state, and contracts remarkably on drying; assuming a compact solid form, which breaks with a smooth or resinous fracture, and presents a semi-carbonized appearance of a deep black brown color, very much like coal. It burns, however, more like wood, readily, and with a bright flame, emitting a great deal of smoke, and woody odour; also leaving a white ash. In different parts of the lower clay, oyster shells are found, adhering to boulders and loose stones, the same as those now found on the shores. Pholadine tubes, infiltrated with calcareous matter, also abound throughout the clay, and here and there the remains of crab-shells, &c. I have not met with any remains of man, or any other animals, in the clay, and no pottery, or anything resembling an artificial construction, I believe, has been found in it.

There is a feature of this clay, however, which is very remarkable, viz. the *Kunkur formation*. This, which consists of concretionary limestone, occurs massive, or scattered throughout the clay in small isolated portions. In its massive state it is found in large boulders, or in continuous tracts, reposing on the fresh-water strata or igneous rock beneath, and in this state is compact and cavernous, enclosing portions of

the clay in its cavities, &c. in which it has been formed, or as a conglomerate with sandy or gravelly detritus from the igneous rocks, and the remains of small shells, assimilating it to the sandy beaches. Those portions which are scattered throughout the clay are more or less round, like septaria; very uniform in structure, and some so pure that they wholly dissolve in nitric acid. They are generally of a blue color, but sometimes quite white, and identical with chalk. Like septaria also, they are irregular, and almost invariably envelope the remains of some organic matter, such as pieces of reeds, wood, the remnants of crab-shells, &c. &c. which are very frequently removed, and leave nothing but their moulds in the centre of the concretions. This substance also accumulates in the interior of shells, and almost always fills the cavities of pholadine tubes which have been formed in the clay. It does not always, however, envelope organic remains, but may be seen appended to them in a globular form—to the pincher of a crab-claw for instance. Occasionally it may be seen in a vertical section of the clay, in the state of a number of isolated particles or concretionary nuclei round a piece of wood, as if in process of forming a nodule, not by successive layers, but by the increase of substance round different centres. It will hardly be asked where this lime comes from, when we have seen so much of it in the igneous rocks, and in the laumonite filling their cellular cavities, which mineral contains twelve per cent. of lime.

Beaches.—Lastly, we come to the sandy beaches, which are chiefly found on the northern and southern sides of the island, and not on the western or eastern sides: not on the western, because the whole is composed of black basaltic rocks, extending probably for a long distance into the sea; and not on the eastern side, because there are no waves to throw it up, since wave-action, combined with the presence of sand, &c. is of course absolutely necessary for this purpose. Hence it is at the mouths of estuaries such as these, emptying themselves into the sea on the north and south of the island of Bombay, that we chiefly find such beaches: the sand is brought down by them, and, when flowing into the sea, is there turned back by the waves upon that part of the shore which by its form and position is best adapted to receive and retain it. Thus we see the chief accumulation of this sand in Back Bay and at Mahim, the former on the north, the latter on the south side of the island; and each of these beaches presenting their concavities to the N.W. and S.W. respectively, from the inner side of the island being so much longer than the outside. At Sewree, also, which presents a short shore with a southerly aspect, there is a

small beach-accumulation, which seems to have been thrown up by the swell of the South-west Monsoon, as it falls almost point-blank upon this bit of shore on its way up the harbour. Also, in the centre of the island, there is a patch of beach six feet thick, called Phipps' Oart, from which the railroad contractors have obtained sand for the surface of the railroad. At first it appears thoroughly isolated, and difficult to account for, but when we observe a breach in the eastern and western ridges of the island immediately opposite it, and see the remains of shells and sand, scattered over the surface of the clay in a line between these two breaches, we no longer hesitate in applying the same reasons for its occurrence here that we have in other places, viz. that through the breach in the eastern ridge came sand from the harbour, and through the breach in the western ridge, viz. that at the Vellard, came the waves from the sea which ponded it back, and formed the mound mentioned. At that time the island must have been divided into two parts, and the cause of this being discontinued would seem to be sought for in its subsequent elevation; but the summit of the mound of sand and shells called Phipps' Oart not being more than about nine feet above the sea at high-water, and the latter kept from overflowing a great part of the Flats by embankments, the drying up of the island would seem to be more from the accumulation of detritus brought down from the hills on the main land than from anything else.

At Mahim, the beach is two miles and a half long, and extends 1000 yards inland, and at Back Bay it is two miles and three quarters long, and extends about 600 yards inland, forming segments of large circles at each place. The thickest part of the latter appears to be its western end, where the South-west Monsoon swell beats most upon it, for about its centre, viz. 300 yards from the sea, it is 20 feet thick, 18 feet on the Esplanade opposite the Sanatarium, and towards the southern extremity of the Esplanade 15 feet thick, where it rests on the igneous rocks, and large spheroidal masses of coral *(Cellastrea* Bl.*)*

With the composition of these beach-accumulations we are perfectly acquainted from the wells that have been dug through them. As before stated, the clay thins outwards under them, and they, in return, inland, thin out upon the clay, but have of course always that ridge above the clay which is common to beach-accumulations.

Not having had the opportunities of examining the beach at Mahim that I have of that in Back Bay, though they are both probably alike, I must take my description from the latter. It is composed of beds of yellow sand and small shells, resting on the clay, or on the igneous rocks of the locality, according to that portion of it which is nearest

the sea, and *vice versâ*. The sand is chiefly confined to the upper part, but a few feet down begins to present beds of small sea-shells, for the most part entire. These increase in quantity, and take the place of the sand, while they become cemented together by calcareous matter, and form a concrete mass, which furnishes a rough building stone. The shells for the most part chiefly consist of small bivalves, *Cardium* and *Tellina;* also of small univalves, *Turbo, Cerithium,* and *Nerita;* a large *trochus* and *turritella,* and a thin pearly *placuna;* in short species of all the genera which are now found on that part of the beach which is in process of formation. As before stated, these materials rest on the clay or the igneous rock, and probably in some places on the lacustrine strata, where the latter have not been carried alway by denudation. I have frequently looked among the portions which have been quarried for bones of the human skeleton, and for remnants of pottery, but have never met with either.

This concludes all that I have to offer on the Geology of the Island of Bombay, with the exception of the few following "practical observations."

Building Materials.—The most durable stone is that which caps the basalto-dioritic tract, viz. at Nowrojee Hill, &c. but it is very tough; the next is a more crystalline form, which lies below it; this is much more cleavable, and is found all along the eastern ridge. After this comes a more earthy form, (trappite,) which is found at the base of Nowrojee Hill Quarry; also the so-called "white trap" (aphanite) at Dharavee, a modification of which (spilite) is again met with on the eastern side of the Flats, about the middle of the island, near the railroad, made up partly of carbonate of lime, in the form of calc-spar, &c. It is with this that the principal part of the stone-work of the railway is built; and although not so durable as any of the foregoing, is sufficiently so for economical purposes. Last of all comes the volcanic breccia, in the neighbourhood of Sion, which furnishes a very rough stone, but from its soft argillaceous nature when fresh hewn, and subsequent hardening, it serves very well for troughs, for which it was formerly much used.

Lime.—The concretionary limestone called kunkur, lying at the bottom of the clay in the Flats, in detached masses, or in continuous tracts, together with the nodular forms in the clay itself, furnishes an abundance of lime, the purest coming from the nodules. Recent shells, however, are collected and burnt for this purpose, from their furnishing a still purer material.

Sand.—This comes from the shell-beaches, and, being chiefly com-

posed of the detritus of small shells and argillaceous matter from the disintegrated trappean rocks and fresh-water strata, hardly contains any siliceous sand; hence it makes very bad mortar: much of it being taken from the sea shore also, it is more or less impregnated with salt, which after a while makes the mortar crumble, and, where this is covered with plaster, the latter to fall off. It has always appeared to me a great defect in the plastering of this part of India, not to mix hair, or tow, or straw, with the material. All who have had anything to do with new buildings in Bombay must have seen the plaster frequently falling off from the circumstances I have mentioned, and that no secondary plaster ever stays long on such surfaces. Hence the necessity of taking sand from parts which have been long exposed to the percolation of fresh water, and which is free from salt, and mixing some fibrous material with the plaster, to make both it and the mortar more durable. It is no light matter this in the construction of a building, for without it the expense of repairs will ever be as it is now, endless, and the appearance of the buildings squalid and disgraceful, although an unlimited amount of money may be expended upon them annually.

Wells.—The only rule that can be laid down for digging wells is that the basalto-dioritic tract must be pierced through to the fresh-water strata, and even then there may be no water: for a foot or two below this there may be an intrusion of the igneous rock, and then this must be pierced until arriving at another layer of the fresh-water strata, and so on until water is reached. Sometimes the meeting with a rent in boring through the basalto-dioritic tract, or a dyke of the subsequent igneous effusion, may, by communicating with water below, yield the latter before it could otherwise be expected; but from the manner in which the fresh-water strata and superincumbent basalto-dioritic tract have been broken up and intruded throughout the island, by the subsequent igneous effusions, it is plain that none of these springs can be inexhaustible. Last year proved it, for nearly all the wells were dry from the scarcity of rain the year before. There is another fact, viz. that many of these rents and dykes let in a spring of brackish water: this is particularly the case in the neighbourhood of Byculla. Experience there has often exemplified the proverb, that "you may go further and fare worse." This was the case in a tank enlarged by Sir Jamsetjee Jejeebhoy on the north side of the Grant College. In sinking a well at the south-western corner of Baboola Tank last year, too, the workmen came upon a thin line of the fresh-water strata, accompanied by an oozing of saltish water, and of course were ordered to cease further operations directly. How it comes to pass that this

water should be brackish I can only conjecture; for it is not owing to the presence of the white rock, (or subsequent effusions,) since at Mazagon there is a well 60 feet deep, entirely excavated in the latter, and yet yielding excellent water. Again, the tank mentioned, which was enlarged by Sir Jamsetjee Jejeebhoy, does not extend into the white rock, and yet the water in it is so brackish that it is hardly fit for anything but watering the roads. Two tanks or wells shall be found within a few yards of each other, the one containing drinkable the other undrinkable water. As I have before stated, all that I can offer in explanation of this is conjectural, viz. that when the basalto-dioritic tract and aqueous strata were broken up by the subsequent effusions, the sea water may have run into the crevices, and there, becoming vapourized, have left its salt behind it; or, otherwise, the sea at the present time may be sucked up by these rents and dykes, which by their intercommunication may carry it here and there throughout that part of the island where the brackish wells are most common. If the former opinion were entertainable, then the constant emptying of these wells should at last make them yield fresh water; but this is not the case, for they are emptied yearly for watering the gardens, and still continue to be salt. At the same time, those which are never emptied are decidedly the most brackish. If, on the other hand, the latter be the explanation, then there is no remedy for it.

Coal.—The quantities of this mineral found at the cutting of the Sluices, where the fresh-water strata containing it have only been excavated for a few cubic yards, is very trifling, although the fossilized wood and debris of vegetable remains is very considerable. The nature of the coal is described at page 176. It hardly ever occurs in grains larger than a pea, and for the most part in layers over compressed flat long leaves or stems; although the whole of this part of the fresh-water deposit is highly carboniferous. At the same time it should be remembered that in the only place where these strata have been exposed they have been broken up by the intrusion of the igneous rock, and that although the wood and other vegetable remains in them here are principally replaced by argil, yet that they may be more coal-bearing in other parts. A further examination, then, of this part of the fresh-water formation in different localities would be highly interesting, if, even after all, it should not prove useful.

List of Rock-Specimens, Minerals, and Fossils, from the Island of Bombay, illustrative of the foregoing Paper.

Presented by Dr. LEITH, and the Author.

[Those marked with a † were presented by the former, and those with an * by the latter; the † and * together denote that specimens of the same object have been presented by both.]

No.

1 * Tough bluish-grey basaltic diorite, containing olivine, and grains of magnetic iron ore, from the upper part of Nowrojee Hill.

2 * Fissile and more compact, from ditto lower down.

3 * Fine-grained crystalline diorite, from the ridge extending northwards from Jakaryah's Bunder.

4 * Mottled blue and brownish grey diorite, from the ridge extending northwards from Khandlee Battery.

5 * Orbicular or botryoidal diorite, from the same ridge a little south of Tank Bunder.

6 * Tough black fine granular basalt, from hexagonal prisms at Worlee.

7 * Fissile black or dark fine basalt, from beneath the surface Malabar Hill.

8 * Tubes, formed of crystalline quartz, from bottom of basalt Mama Hajanee.

FRESH-WATER STRATA.

9 * Portions of the upper part of the fresh-water strata, from different localities: the light brown from the tank north of the Horticultural Gardens, and upper part of Baboola Tank; the blue from the well (see p. 199) in Baboola Tank; the brown from the spilite on the eastern side of the Flats, nearly opposite Parell; the greenish or bluish grey or brown from the Sluices; the blue and brown from a well on Malabar Hill.

10 * Portions of the stratum composed of the casts of cyprides, from the northern side of the breach at the Sluices; ditto from the northern end of Chinchpoogly ridge.

11 * Greenish grey or brown shale, from the Sluices.

12 * Ditto, with interlaminated black shale, from ditto; also from a well on Malabar Hill.

13 * Black bitumenous shale, from ditto, and from a well on Malabar Hill.

14 * Chertified aqueous strata, bent.

15 * Basaltified ditto, with organic impressions.

16 * Jaspidified ribboned ditto.

17 * Chertified portion of cypris-stratum.

18 * Ditto jaspideous ditto.

19 * Coal from the Sluices.

20 * Mineral resin from ditto.

VEGETABLE REMAINS.

Roots.

21 † Cormiform, conical roots? from the Sluices, (several specimens and sections,) (p. 177).

No.

22 † Cormiform, globular, from the Sluices (several specimens and sections).

Stems.

23 *† Cylindrical, (two specimens,) (p. 178).

24 *† Wood, dycotyledonous, several specimens of, large and small,—and monocotyledonous, (bamboo ?) (p. 178).

25 *† Ditto with bark, two specimens (p. 178).

26 *† Fungoid or adventitious woody excrescences ? in the bark (p. 178).

Leaves.

27 * Oval, small,—like leaflets of an acacia (p. 179).

28 *† Long, flat,—like bulrushes, large and small (p. 180).

29 † Scaly, long leaf, or surface of a stem ? (p. 180).

30 † Lanceolate leaves, like those of bamboo (p. 180), also cordate leaves.

31 † Impression of Cyperus ?

Seeds.

32 *† Small, flat, lenticular capsule, with a ring of seeds arranged round the internal margin (p. 180).

33 † Seed like *artabotrys odoratissimus* (p. 181).

34 † Siliquose seed-pod (p. 181), with sections (several specimens).

35 † Ditto, (p. 181).

ANIMAL REMAINS.

36 † *Cypris semi-marginata* (H. J. C.) (p. 181).

37 * *Cypris cylindrica* (Sow.) (p. 182).

38 * Another species, *C.* ————? (p. 182).

39 † Lymnadia ?

40 † Elytra of a small coleopterous insect, right wing (p. 183).

41 † Impressions of fresh-water shells, Melania ?

42 * Do. do. do. Paludina ?

43 † Do. do. do. Pupa ?

44 *Rana pusilla*, (Owen,) Skeletons of, several specimens (p. 184).

45 Do. do. do. large and small. (In these specimens, though one skeleton appears larger than the other, the thigh bones are all of the same length.)

46 Do. do. do. in different layers an inch apart, (two specimens,) (p. 186).

47 * Do. do. do. on a layer of cyprides.

48 * Do. do. do. bones of, scattered in intruded igneous matter (p. 186).

49 ‡ *Testudo Leithii.* (H. J. C.)—*a* carapace and plastron ; *b* ditto with head ; *c* head alone ; *d* left half of the carapace and plastron ; *e* fragment of ditto ; *f* ventral part of pelvis and sternum opposite ; *g* fragment of carapace, with margino-collar scales ; *h* fragments of marginal scales ; *i* ditto ; *k* ditto ; *l* right two-thirds of carapace and plastron.

2ND EFFUSION.

50 * Greenish blue and black trappite, from Nowrojee Hill, below the line of aqueous strata.

No.

51 * Amygdaloid trappite, from Baboola Tank ; cells filled with crystals of laumonite.

52 * Laumonite and dog's-tooth calc-spar, from a geode in ditto.

53 * Rhomboidal calc-spar in mass, from ditto ditto.

54 * Ditto ditto following a line of aqueous strata ; from do. do. (p. 199).

55 * Ditto ditto in a minute imbricated form, separate, and covering dog's-tooth crystals, from ditto ditto.

56 * Prehnite from ditto ditto.

57 * Amygdaloid trappite, from a tank north of the Horticultural Gardens.

58 * Black fine-grained crystalline diorite, from Baboola Tank.

59 * Compact blue amygdaloid trappite, from Baboola Tank ; cells elongated, and filled with massive laumonite.

60 * Greenish grey amygdaloid trappite, cells filled with green-earth, from the neighbourhood of the house called Lowjee Castle.

61 * Ditto decomposing, cells filled with quartz crystals, from upper side of dyke in Chinchpoogly ridge.

62 * Hyalin and amethyst quartz crystals, from crushed geode in ditto.

63 * Amygdaloid with brown earthy base, and cells filled with quartz crystals, from neighbourhood of Sindu Para.

64 * Brown aphanite, the so-called white trap, from Dharavee.

65 * Ditto amygdaloid, from ditto ; cells filled with fine white clay-earth, (decomposed green-earth or laumonite,) (p. 193).

66 * The same decomposing into a mottled red and white material, like laterite, of a granulo-plastic nature (pp. 196 & 202).

67 * More earthy aphanite, spilitic, with fragments of organic remains, and calc-spar, from the eastern side of the Flats opposite Parell. Forms a good stone for building, and is easily hewn.

68 * Blue spilite, (aphanite and calc-spar,) calc-spar, disseminated, from ditto.

69 * Brown ditto, with calc-spar in small masses (amygdaloidal) from ditto.

70 * Brown ditto, with calc-spar in veins, from ditto.

71 * Unsymmetrical, compressed, lenticular crystals of calc-spar, standing on their edges in a geode of ditto, from ditto.

72 * Blue spilite, with small crystals of calc-spar, passing downwards into trappite, from ditto.

73 * Fine blue clay aphanite, from a well on Malabar Hill.

74 * Coarse aphanite, from ditto ditto.

75 * Brecciated aphanite, from ditto.

76 * Coarse aphanite, intruding fresh-water strata, from the eastern side of the Flats.

77 * Aphanite bearing fragments of vegetable remains, from ditto.

78 * Ditto black ditto, from a well on Malabar Hill.

79 * Ditto bitumenous ditto, from the Sluices.

3RD EFFUSION.

80 * Coarse breccia, from the neighbourhood of Tank Bunder.

No.

81 * Blue breccia, with white fragments, from a well on Malabar Hill: *b* ditto from Sion; *c* ditto brown from ditto; *d* ditto red from ditto; *e* ditto white and red decomposing; *f* ditto red compact.

82 * Ditto black jaspideous from Antop Hill.

83 * Ditto jaspideous, black, from Sewree.

84 * Blue breccia, passing into red clay, from Sewree.

85 † Ditto, containing a large fragment of large-grained diorite, near the village of Wadalla (p. 196).

86 * Ditto, containing amygdaloid diorite; *a* ditto containing amygdaloid trappite or aphanite, from ditto and Sewree.

87 Ditto, containing portions of aqueous strata.

88 * White amygdaloid aphanite; cells very much elongated, and filled with calcedony or quartz crystallized, from Chinchpoogly ridge.

89 Geode from ditto, containing crystals of quartz and amethyst.

90 Ditto from ditto, containing agate.

4TH EFFUSION.

91 * Portion of amygdaloid aphanite, from the dyke at Sewree; cells containing fine white clay-earth.

GHORA BUNDER, IN SALSETTE.

92 * Specimens of amygdaloid aphanite, and volcanic breccia; also specimens of aqueous strata from the latter.

MARINE FORMATION.

93 * Blue clay of the Flats.

94 * Massive kunkur, from lower part of ditto.

95 * Small kunkur-conglomerate, resembling transformed sea-beach, from ditto ditto.

96 * Nodular kunkur, from ditto.

97 * Charred wood, from ditto.

98 * Infiltrated pholadine tubes, from ditto.

99 * Concrete sea-beach, coarse.

100 * Concrete sea-beach, fine.

101 * Shells from ditto.

102 * Spheroidal masses of calcareous coral (*Cellastrea* Bl.) beneath ditto, Esplanade.

EXPLANATION OF THE PLATES.

PLATE VI.

Geological Map of the Island of Bombay.

PLATE VII.

Fig. 1.—Cormiform root of aquatic plant? natural size.

a Upper end, truncated.
b Lower end, broken.

Fig. 2.—Globular root of aquatic plant? natural size.
a Lateral view.
b Upper end, showing lines of petiolations?

Fig. 3.—Lateral view of a portion of a stem, natural size.
a Lower end, showing lines of petiolations?

PLATE VIII.

Fig. 4.—Oval leaf, natural size.
Fig. 5.—Round leaf, natural size.
Fig. 6.—Compressed stem or leaf of aquatic plant, with root, natural size.
a Magnified view of longitudinal striæ on its surface.
Fig. 7.—Scaly impression of leaf or stem, natural size.
a Two scales, well preserved.
Fig. 8.—Form of the end of a flat, long leaf, which is very common, natural size.
Fig. 9.—Impressions of leaves, like those of bamboo, natural size.
Fig. 10.—Impression of a cyperaceous plant? natural size.

PLATE IX.

Fig. 11.—Small lenticular seed, magnified.
a Natural size.
Fig. 12.—Oval, compressed seed, with apparently *ruminate* albumen, magnified.
a Natural size.
Fig. 13.—Seed-pod, broken off at one end, natural size.
Fig. 14.—Seed-pod, natural size.
Fig. 15.—*Cypris semi-marginata.*
Fig. 16.—*C. cylindrica.*
Fig. 17.—*C.* ——— ?
Fig. 18, 19, 20.—Valves of recent cyprides, from the fresh-water deposits of Bombay.
Fig. 21.—Elytra of coleopterous insect, magnified.
Fig. 22.—Cast of shell, natural size.

PLATE X.

Testudo Leithii.—Carapace, and upper part of head of, natural size. *a* Point of tail.

PLATE XI.

Testudo Leithii.—Plastron, and inferior aspect of lower jaw of, natural size. *a* Impressions of posterior extremities. *b b* Union of pelvic bones with posterior part of sternum. *c* Point of tail.

ART. II.—*Recent Investigations in Zend Literature.* By the Revd. J. MURRAY MITCHELL.

Presented March 1849 and February 1852.

THE first of the two following papers was read a considerable time ago, soon after the appearance of the articles to which it refers, in the *Zeitschrift der Deutschen Morgenländischen Gesellschaft;* but I have hitherto declined to comply with the request of the Society that it should appear in the Journal, in the hope that the important papers of Spiegel and Roth might be given to the English public *in extenso* by some student of Oriental antiquities at home. I see, however, no intimation of any intention to reproduce these papers; the country of Hyde not only seems to have abandoned original investigation into the ancient religious system of Persia, but to be disinclined even to acquaint itself with the progress of Continental scholars in this very interesting field of inquiry. In the absence, then, of a full translation, the following paper is now published, as containing a brief statement of some of the most important conclusions to which the students of Zend literature have at present arrived.

I.

The very rapid progress that has of late years been made in the opening up of the most ancient religious monuments of the Hindus is well known to all who take an interest in Oriental investigation. The Veda is no longer a mystic and unintelligible book. For a considerable time after Colebrooke's Essay on the Vedas was published, it seemed as if the investigation could not advance beyond the point to which he had brought it; but recently the study has been prosecuted with redoubled zeal, and with most satisfactory results.

There is, however, another religious monument of the ancient East, scarcely less interesting than the Veda, on which comparatively little light has as yet been shed. The Zendavesta, the sacred book of the ancient Persians, is still an unintelligible volume. The investigation slumbered from the days of Anquetil du Perron until M. Burnouf took it up. He accomplished much; but notwithstanding his zealous

and successful labours, a deep darkness still enveloped everything pertaining to the ancient books and ancient religious history of the Persians. Light, however, is now breaking in,—we have at least the promise of a dawn; and it is an interesting thing to observe that a considerable portion of the light which is now resting on the Zendavesta is reflected upon it from the Veda.

That the ancient Hindu and ancient Persian races were not very remotely descended from one common stock—now generally denominated the Arian stock—is a fact with which doubtless all present are familiar. A comparison of the languages used by the two races establishes the point to a demonstration. A connexion somewhat similar, although not capable of being traced out to the same extent, exists between the religions of the two races. The points of resemblance here are not merely those which are common to all religions, nor those common to all the religions of the great Indo-Germanic family: they cannot with any show of reason be pronounced either accidental, or the result of intercourse between the two races in later times; but they appear to be based on an original relationship, or rather identity, of the two systems. Each of these throws light upon the other, and the Veda and the Zendavesta—the ancient sacred book of the Hindus, and that of the Persians—ought to be studied in their mutual connexions. The relation of the two books is thus well stated by Dr. Roth:—"The Veda and the Zendavesta are two rivers, flowing from one fountain-head: the stream of the Veda is the fuller and purer, and has remained truer to its original character; that of the Zendavesta has been in various ways polluted, has altered its course, and cannot, with certainty, be traced up to its source."

The Veda and the Zendavesta present two subjects of study that are of very unequal difficulty. The study of the former is by far the easier task. Not to mention that the Sanskrit language, in which it is composed, is still a living language, although doubtless in a form greatly altered from the "rustic dialect" (to use Colebrooke's epithet) of the Veda, we possess admirable commentaries on the Veda written in easy Sanskrit, grammars, lexicons, explanatory notes, &c. &c., which were composed by accomplished Hindus at a time when the study of the Veda was still prosecuted with zeal and success. On the other hand, the Zend must be called a dead language; and to aid us in the study of the Zendavesta we possess a Sanskrit translation of a very small part of the work, a Pehlivi translation, which is as enigmatical as the Zend, the bare rudiments of a lexicon or vocabulary, but not even the rudiments of a grammar. When we add to this slender *apparatus*

criticus the traditionary exposition of their sacred books by the Pársís, as presented in their later versions and commentaries, we have exhausted the list of the aids at our command in the study of the Zendavesta.

In that invaluable repository of information on so many branches of Oriental literature, the *Journal of the German Oriental Society, (Zeitschrift der Deutschen Morgenländischen Gesellschaft,)* two papers have recently appeared, which are highly deserving of attention, as important contributions to our knowledge of the Zendavesta. One, by Dr. Friedrich Spiegel, is entitled "Studies on the Zendavesta"*; the other, entitled "The Legend of Feridun in India and Iran,"† is from the pen of Dr. Rudolph Roth, whose important treatise on the Literature and History of the Veda was formerly brought to the notice of the Society. (See Journal, vol. ii. p. 401.) The latter more especially demonstrates that light can be thrown on the Zendavesta by the Veda.

Dr. Spiegel's article is chiefly occupied with the consideration of the aid which Pársí tradition affords us in the investigation of the Zendavesta. He takes occasion to pronounce an opinion on the merits of the celebrated French version, by Anquetil du Perron. The work of Anquetil is so generally accessible, and so likely to be had recourse to as an easy means of information on the subject of Pársíism, that it is of importance for us to ponder the judgment which the German critic passes on its merits, lest we be led astray by deceptive lights. "The French version," says Spiegel, "was long held to be correct: it was believed that a closer investigation of the languages of the ancient books would be advantageous to philology, and might here and there modify the translation in details; but that substantially the conclusions of Anquetil would be confirmed. Contrary, however, to all expectation, recent investigation has completely set aside the results which we had deemed so certain, and has demonstrated that the whole inquiry must be commenced *de novo*. It is no longer a secret, that Anquetil's version is not trustworthy."

While employing this severe language, we must not forget—and Dr. Spiegel does not forget—that our obligations to Anquetil are exceedingly great. The zeal and unconquerable perseverance which he displayed in his search for the ancient Persian books are worthy of all admiration; and whatever may be thought of him as a philologist, he was at all

* Zeitschrift der Deutschen Morgenländischen Gesellschaft, I. Band, III. and IV. Heft. p. 243.

† Ibid, II. Band, II. Heft. p. 216.

events a great discoverer. Even had his version been a blunder from beginning to end, still the service he rendered in bringing the Zend writings from India to Europe, and directing the attention of Europe to them, would have entitled him to our gratitude and respect.

It has been usual, Dr. Spiegel remarks, to say that Anquetil was misled by trusting to the traditionary interpretation of the Zendavesta by the Pársís. Spiegel, however, doubts the correctness of this opinion. Since the Sanskrit version of portions of the Zend by Neriosengh is on the whole a close and correct rendering, it is scarcely credible that in the course of a few centuries so complete a revolution in the interpretation of their ancient books can have taken place among the Pársís, a people who cling with tenacity to what they believe to be their ancient creed, and who have been, since their arrival in India, subjected to no great national calamities.

Dr. Spiegel mentions that he is not acquainted with the modern Gujarátí versions of the Zendavesta. These will be referred to afterwards; but in the mean time we may remark that they confirm the opinion he has expressed. Most certainly Anquetil deviates widely from those versions that are at present accessible in Bombay; nor is it conceivable that in Surat, towards the end of last century, when he was there, the Pársís gave an interpretation of their sacred books nearly resembling that presented in Anquetil's work. Spiegel's opinion that Anquetil must have *guessed* the meaning from the Persian renderings which his Pársí teacher supplied him of the Zend vocables, and must deliberately have tortured the stubborn terms till they appeared to yield some intelligible sense, is no doubt correct. Had Anquetil confessed his ignorance, (for he must have been aware of it,) he would have possessed a far stronger claim to our respect and gratitude than as the case now stands.

Spiegel's paper is mainly occupied with the tradition of the Pársís as contained in the Huzvaresh or Pehlivi version of the Zendavesta. In the entire absence of grammatical, and the almost entire absence of lexicographical, works on the Zend language, we are necessarily dependant on the translations that, happily, have come down to us; and pre-eminent among these is the oldest, or Pehlivi. From it, indeed, all later versions have been drawn. Of the date and character of the Pehlivi language a good deal is known from coins and inscriptions. It belongs to the era of the earlier Sassanian kings of Persia, [from A. D. 226 onwards,] and we may pretty safely refer the Pehlivi version of the Zendavesta to the same age. It is of high importance in the criticism of the Zend text. The fixing of a correct text is the first step

we must take in an investigation of all records. Comparing the Veda with the Zendavesta, we can rely on the readings of the former much more confidently than those of the latter. The original Vedic text appears to have been wonderfully well secured by the various safeguards that were had recourse to; but the case is far otherwise with the Zendavesta. In particular, passages exist in the present Zend which do not appear in the Pehlivi version; and these are so embarrassing to the sense that they must be considered interpolations. As translated from a more ancient Zend text than that which now exists, the Pehlivi version is of high value in all questions of this nature.

Equally important is the Pehlivi version in the interpretation of the Zend. The Pehlivi is entirely a Persian dialect. A comparison of the Zend with the Sanskrit furnishes most important elucidations; but the connexion between Zend and Pehlivi is still closer, and, were the latter only as well understood as Sanskrit, it would be still more fruitful of results.

Spiegel illustrates at some length the utility of the Pehlivi version as throwing light on the state of the Persian religion in the time of the Sassanian kings. Wholly apart from its use as a translation, as a relic of the Sassanian dynasty it is possessed of much historical value. The Sassanian epoch is one of the highest importance in the history of Asia—and of Asiatic *mind;* but unhappily it is involved in much obscurity. The science of History may expect to receive interesting contributions from the light which will be shed on that epoch from the study of the Pehlivi version of the Zendavesta, and the works connected with it. At that period, Persia by no means secluded herself from intercourse with foreign nations. Greek and Christian influences acted powerfully on the Persian mind; and Pársíism, again, largely contributed to the opinions of the Gnostics and Manicheans. The western influence acted on Persia in two modes; the one, translations of Greek writers into Persian, the other, direct contact between the Persians and the Syrian Christians who were scattered in large numbers throughout the country.

The large number of Syriac words occurring in Pehlivi has long attracted attention; and Sir W. Jones expressed his "perfect conviction that Pehlevee was a dialect of Chaldaic." The usual explanation of this fact is that Pehlivi must have prevailed in the west of Persia, and there come in contact with the neighbouring Syriac; but the facts above noted have suggested an ingenious explanation to Spiegel of a different kind. He thinks that instead of personal, it may have been literary, intercourse between the Syrians and Persians that occasioned the similarity—the large circulation of Syriac books and ideas in Persia

naturally leading to the transference of many words, just as the theological terms in modern Persian are to a large extent drawn from Arabic, the sacred language of Muhammadanism.

Dr. Spiegel's paper contains a brief notice of the history of the Pársí religion since the period of the Sassanian kings, which we pass over. He has two or three pages on the subject of *Pársí Eschatology*, which we hope afterwards to refer to. We shall doubtless soon see still further results from the labours of this very diligent investigator. In the mean time we proceed to notice the paper of Dr. Roth on *The Legend of Feridun in India and Iran.*

It has been well known for a considerable time that many of the technical religious terms occurring in the Veda are reproduced in the Zendavesta. Thus, the Vedic *Yajata*, meaning *worshipable*, is an epithet of the gods, and corresponds with the Zend *Yazata*, which denotes an *Izad*, or angel of the second class; the Vedic *soma* corresponds with the Zend *haoma*, the hom plant; the Vedic *deva* with the Zend *daêvo*; and the first half of the Zend name of God, *Ahura Mazdâ*, (Hormazd,) apparently with the word *Asura*, which is frequently applied as a laudatory epithet to Vedic deities.* Thus, farther, *Vivanghvat* in Zend corresponds with the Sanskrit *Vivasvat*†; and the son of the former, *Yimo*, with *Yama*, the son of the latter. The identification of proper names thus happily commenced by Bopp and Lassen has been carried out by Dr. Roth, in the case of the word *Feridun.*

The name of Feridun, the sixth king of the Peshdadian dynasty, is one of the most renowned in the whole compass of Persian history. The epic genius of Firdausi has found a congenial theme in the mighty achievements of "Feridun the Fortunate"; and later prose writers have delighted to hold him forth as a pattern of every virtue. Amid the confessedly inextricable confusion in which the primeval annals of Persia are involved, it has been fondly imagined that with him at all events we discern some traces of historic truth. The greatest exploit of Feridun was the overthrow of the tyrant Zohâk. Notwithstanding all the wild fables recorded of the latter,—such as that the devil kissed his shoulders, and made two fearful serpents spring from them, which required to be daily fed on human brains,—it has been customary to recognise in Zohâk the representative of a Western invasion, Arabian or Assyrian; and the thousand years during which he is said to have reigned have been held as the probable duration of the conquering

* Lassen's Indische Alterthumskunde, I. p. 522.

† Bopp's Nalus, 2nd Ed. p. 203. (1832.)

dynasty. Feridun is thus represented as the deliverer of Persia from a foreign yoke; and Sir John Malcolm is so far satisfied of the reality of his existence as to identify him with Arbaces the Mede, who is stated by Greek historians to have overturned the Assyrian monarchy under the effeminate Sardanapalus. There is a well-known passage of Firdausi to this effect :—

> "Feridun the fortunate was not an angel,
> Neither was he formed of musk and ambergris;
> He acquired his glory by justice and liberality:
> Be thou just and liberal, and thou shalt be a Feridun."

Now, if the conclusions of the German critic be accordant with truth, Feridun was certainly not formed of musk and ambergris, but he was composed of materials still less earthly and substantial: Feridun, in short, according to Roth, is no historic personage at all—he is simply one of the deities acknowledged in remote times by the Arian race; and, without any figure of speech, we may say that the battles which Firdausi celebrates with so much Homeric fire took place in the region of the clouds.

The investigation of this point by Roth is full and minute; but it will be sufficient to mention the more important particulars in the inquiry. The modern Persian word *Feridun* is derived from *Phréduna*, a softened form of the Zend *Thraêtóna*. In the Zendavesta he is said to have slain the destructive serpent with three throats, three tails, six eyes, and a thousand powers, which was created by Ahriman for the destruction of the world. This slaying of the serpent is in fact the sum and substance of the history of Thraêtôna in the Zend books. In the poetical narrative of the Shah Nameh the name of the tyrant whom Feridun slays is Zohâk; but Firdausi also writes the name اژدهاک *ash dahâk*, which is almost exactly the Zend *ashi dahâk*, i. e. *destructive serpent*. Thraêtôna is the son of *Athwya*, which in Persian is written *Athin*, or, as changed by Firdausi, *Abtin*.

Nearly the whole of this seems to occur in the Veda. In the Veda *Trita* occurs, or, as it is at least once written, *Traitana*, which closely resembles Thraêtôna. The Zend Thraêtôna is the son of Athwya; the patronymic of the Vedic Trita seems to be Aptya—an exact coincidence, the interchange of *t* and *p* being frequent between these languages. In Zend *Athwya* can hardly be etymologically significant; but the Sanskrit Aptya yields it a meaning, viz. "water-inhabiter," or "water-ruler."

But the resemblance goes beyond names—it extends to acts. Thraêtôna in the Zend books slays the "destructive serpent," and so does

Trita in the Veda. The serpent in the Zend books is a horrid monster, three-headed, three-tailed, and six-eyed: the Vedic serpent is very similar. We read thus in one of the Vedic hymns (x. 1, 8, 8):—

> "The Aptya (*i. e.* Trita) knew his father's arms to wield;
> Sent (or, encouraged) by Indra, strode he to combat:
> The three-headed being, with seven tails, Trita slew,
> And the might of Twáshtri set the cattle free."

So far the resemblance is singularly exact. The champion, the enemy, the battle, are almost identical in the Veda and the Zendavesta. A difference exists between them as to the prize contended for.

In the Veda, Trita is a divine personage, who contends against the serpent for the rescue of the cows. We have here an edition of the old legend which occupies so prominent a place in the religion of the Veda, viz. that demons seize on the waters,—the many-tinted clouds, when, like cows going to pasture, they move across the sky,—carry them off captive, and bind them in fetters beyond the horizon; or, what is another form of the same thought, the malignant being who dwells in the mountains, locks up the springs in the dark recesses of his rocky caverns. Then it is that the thunderbolt of Indra (or, the arrow of Trita) cleaves the rocks, or rends asunder the dark mantle with which the demon has enveloped the sky, and then the imprisoned waters leap forth to liberty, and rush down to cheer and fertilize the earth. Such is the famous battle—one perpetually recurring in the Vedas; and such precisely is the battle between Trita and the serpent. Now in the Zendavesta the scene shifts; the battle is transferred from heaven to earth. The champion is the mortal son of a mortal sire; and the serpent he slays is a creation of the evil power, which is furnished with devilish might for the destruction of good in the world.

And then, lastly, comes the later Persian hero-legend, as presented in the great poem of Firdausi, the Sháh-Námeh. Here the attempt is made to draw the whole representation into the province of actual history. The battle is in Persia; the three-headed serpent is Zohâk, with a serpent springing up from each shoulder; he is seated on the usurped throne of Persia; his wickedness is the tyranny which he exercises ever his conquered subjects; and the blessing for which the noble Feridun contends is freedom to his country, and the restoration of its ancient royal line.

Dr. Roth thinks he finds some evidence of the fact that Trita—who certainly is not often mentioned in the Vedas, perhaps not oftener than thirty times—was a far more important person in the period anterior to the collecting of the Vedic hymns than he afterwards became. His

similarity to Indra may have obscured his renown, as it certainly rendered his services of less importance. Apparently he was the ruler of the distant sky-waters, while Indra swayed over those in the visible heavens immediately around us. Trita is removed to the farthest point in space to which imagination can reach; thus in the prayer (viii. 6, 5, 13, &c.)—

> "Our sins, be they known, or be they secret, oh gods!
> Remove all far away from us to Trita the Aptya."

The supposition that the Vedic Trita, a divine being, is changed in the Zend and Persian books into a mortal hero of earthly mould, although rather startling at first sight, may be divested of all antecedent improbability by analogous facts that do not admit of question. One of the most renowned personages in the poem of Firdausi is Jamshid, the fourth king of the Peshdadian dynasty, whose romantic tale of love and sorrow is from first to last of the most earthly complexion. Yet it has been demonstrated to the satisfaction of Orientalists that the Jamshid of Firdausi, the Jam of other books, and the Yimo of the Zendavesta, are all one, and all identical with a deity in the Vedas, Yama. The king Jamshid of Firdausi appears in the Zendavesta as Yimo, a servant of Ahura Mazdâ, who ruled on earth during a golden age, in the earliest period of the world's history. On the contrary, in the Veda, Yama dwells in heaven as the ruler of the spirits of the departed, who banquet with him. (x. 1, 14, 10.) Thus it is said of him (ix. 7, 10, 7. 8):—

> "Where is the unextinguished light
> In the world, where the sunbeam dwells,
> Thither bring me, O Soma, into the immortal, inviolable world;
> Where the son of Vivasvat (Yama) ruleth as king,
> Where the steps up to heaven are,*
> Where those great waters dwell,
> There let me immortally be!"

Dr. Roth concludes his interesting inquiry with the following sentiments, the truth and importance of which will be generally admitted.

The time is now come to answer all questions as to the historic value of the accounts given by Firdausi and his innumerable followers respecting the early Persian kings; and we can do it by the assistance of the long-concealed but now disclosed legends of ancient India, [as contained in the Veda,] which must be connected with the statements of the Zendavesta. No confidence can be placed in the representations

* Roth, in a later paper, translates this "in the innermost of heaven."—*Zeitschrift*, IV. 427.

of the Musulman writers. Not from works later than the Zendavesta, but from earlier ones, must light be obtained,—light, before which many figures which have been held as real flesh and blood will fade away like spectral illusions. But it is better to confess the void, and allow it to remain until we can gradually fill it with genuine forms, than view it through the delusive glimmer of a cloudy mythology. Instead of vainly toiling to extract historic truth from Firdausi's fascinating song, better far to make at once the humiliating admission that we are at this moment in total ignorance of the history of Persia as far down as the days of Cyrus.

II.

Since I last had the honour of bringing before the Society the chief facts connected with the recent progress of investigation in Zend literature, great advances have been made by some of the Continental Orientalists. I cannot attempt at present to comment on the labours of all who are doing good service in this important field of inquiry; I shall in a great degree confine this paper to a notice of the zealous and successful studies of two, whose names are already familiar to you—Professor Spiegel, of Erlangen, and Dr. Rudolph Roth.

Had time permitted, it would have been well to attend to the very useful work of Professor Brockhaus, who has given us an edition of the Zendavesta in Roman characters.* The index of this work is exceedingly useful; and the glossary is a valuable gift in the present state of Zend lexicography.

I have not yet seen the work on the first five chapters of the Vendidad that has been published within these few months by Lassen, but everything that comes from his pen must be of the highest value.†

Dr. R. Roth, whose interesting paper on the Legend of Feridun in India and Iran I have already brought to the notice of the Society, has continued the same style of investigation in an article on the Legend of Jamshid. (See *Zeitschrift der Deutschen Morgenländischen Gesell-*

* Vendidad Sade. Die Heiligen Schriften Zoroaster's: Yaçna, Vispered, und Vendidad. Nach den lithographerten Ausgaben von Paris und Bombay, mit Index und Glossar, herausgegeben von Dr. Hermann Brockhaus. (VENDIDAD SADE: *The Sacred Writings of Zoroaster: Yaçna, Vispered, and Vendidad. Edited after the lithographed editions of Paris and Bombay, with Index and Glossary. By Dr. H. Brockhaus.)*

† LASSEN (Christianus) Vendidadi Capita quinque priora.

schaft, IV. *Band*, s. 417.) Roth is not the discoverer of the identity of the Vedic *Yama*, and the Zend *Yimo*, or *Yimo Khshaêta*, i. e. *Yimo the Ruler*, or, as the designation is softened in the later Persian and Gujarátí, *Jamshid*. His paper is interesting, as fully unfolding the position which Yimo holds in the Zendavesta, and that of Yama in the Veda—positions very far from identical. In fact, amid the thousand fantastic metamorphoses to which mythological beings are subject in the lapse of centuries, we can scarcely discover a change more complete than that which the original Vedic deity Yama has been made to undergo. The word Yama, which it has been hitherto customary to translate *Tamer, Subduer*, Roth contends can only mean *Twin*, (from the same root as occurs in the Latin word *Geminus, Gemellus*). Yama is the twin-brother and Yamí the twin-sister; and Roth believes that these "twins" simply designate the first pair of the human race. But how deduce from this the general Vedic idea of Yama? The first man, says Roth, was the first stranger who found his way to the abode of the immortals, and the natural head of those who are destined, each in his order, to follow him thither,—Yama is the leader (prince) of beatified men. He dwells with the gods, and banquets with them. His dwelling is a place of joy—even of revelry.

In the Zendavesta, Yimo is the head of a golden age. In his kingdom there was "no frost, nor heat, nor darkness, nor death." We hear also much of a blessed region—a garden, or paradise—into which were collected chosen men, cattle, plants, &c. (See Vendidad, Fargard 2nd; Yaçna, Chap. 9th.)

He is also clearly pointed out in the Zendavesta as the receiver from Hormazd, and imparter to men, of a law or religion. Of the Bundeshne—a much later and most unsatisfactory work, abounding in things unintelligible and absurd—we need not say much; but it makes one statement of some importance, viz. that Jem (Yimo) had a wife, Jemê, or a sister, Jemakê. Connect this with what was said of the "twin-sister" Yamí.

In the great poem of Firdausi, and the innumerable works that draw from it as a store-house, Jamshid is a wise, magnificent, but finally erring and most unfortunate prince, who is expelled by Zohâk, and dies in exile.

But, lastly, the later Hindu idea of Yama is exceedingly unlike the Vedic one. Yama is still indeed the "king of justice—the ruler of the Pitris," or ancestors*; but he is also the king of hell. "These, and

* See Vishnu Purâna, (Wilson's,) p. 152.

many other fearful hells, are the awful provinces of the kingdom of Yama, terrible with instruments of torture, and with fire."*

Such are the magic transformations of mythology! In the books of the one country (Persia), we see the blessed and honoured ruler of a golden age, in whose kingdom evil and death are unknown, changed into a fugitive and miserable prince, who dies by violence; in those of the other (India), the prince of the blessed dead in heaven, in whose realm only pleasure and rapture have place, is metamorphosed into the gloomy and relentless judge of the dead. And all of these four conceptions are as widely as possible removed from the fundamental idea out of which the whole has arisen, viz. that of Yama as the great ancestor of the human race.

Should this identification of Yama and Yimo be permanently retained, (and, startling as the divergencies become, there is little doubt that the connexion traced by Dr. Roth is correct,) it is worth while to note that the conception of Yimo in the Zendavesta and later Persian books remains truer to the original idea than that which is presented in the Vedas. Yimo, the ruler of a blessed period; the teacher—himself divinely taught—of men; the inhabitant of a blessed region or paradise on earth,—this description of *the first man* is singularly like that contained in Genesis, and would seem no indistinct echo of the inspired record. Various questions of course immediately suggest themselves as to the age of the Zendavesta, and the purity of the text, before we can base any very positive conclusions on this coincidence; but the point is eminently worthy of investigation. The further striking coincidences with the record in Genesis which the poem of Firdausi supplies cannot be urged as of very much importance, inasmuch as Biblical ideas, derived from the Korán, mingle themselves to a large extent with all the representations of early Persian history by Persian Musulmans.†

The Orientalist, however, who has during the last three or four years communicated to the public the largest amount of new information, is Dr. F. Spiegel, of Erlangen, whose name is already familiar to this Society. His contributions are numerous and valuable.

In the *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, III. *Band*, s. 246, we have an article from his pen on "The Legend of

* See Vishnu Purána, (Wilson's,) p. 207.

† The name *Jamshid* is still in frequent use among the Pársís. We have it in the first part of the name of our worthy Pársí Knight, which is, in Jonesian orthography, *Jamshid-jí*. We have also in Bombay a newspaper called the *Jám-i-Jamshid*, the *Cup*, or rather *Mirror*, *of Jamshid*.

With respect to the popular conception now prevalent in India regarding Yama,

Sám."* This we may pass over as not very important in its bearing on Zend literature. Sám is the first of a line of heroes—Sám, Zál, Rustam,—who are highly renowned in early Persian history. The conclusion to which Spiegel comes is that the whole account of Sám is unhistorical—a purely poetic fiction. He thus adds another proof to the assertion that the record of the Peshdadian period of the Persian annals, in which the genius of Firdausi so luxuriates, is simply wild mythology.

Directly connected with the Zendavesta, there are several important papers of Dr. Spiegel's. Various articles of his, published in the Transactions of the Royal Bavarian Academy of Sciences, treat of the manuscripts of the Vendidad, and the purity of the text. We omit the consideration of these at present; when Spiegel gives us a collection of various readings in the edition of the Zendavesta which he is now happily carrying through the press, he will doubtless supply us with his matured conclusions as to the state of the Zend text.

He has published a separate paper on "Some Interpolated Passages in the Vendidad." He applies the Pehlivi version to the Zend, and finds numerous passages, some of them important, in which the Zend readings have nothing corresponding to them in the translation. These

the following *abhang*, or Maráthí ode, will suffice. The translation is literal—the abruptness of expression being retained from the original:—

> "Worldly joy here seemeth sweet;
> Afterwards, hard are the pains of Yama.
> They strike, they cut, terribly they slash,
> The servants of Yama, for many years.
> The tree with sword-shaped leaves—fire of Khair—
> Flames of burning oil burst forth.
> They make them walk over burning ground;
> Pillars of fire with their arms they clasp.
> Therefore is Tuká full of pitying sorrow—
> Enough of coming and going, and being born!"

How infinitely unlike the realm of Yama, as pictured in these terrible words, from the region where, "in the innermost of heaven," the Vedic Yama banquets with the divinities! The transformation, as a historical fact, has been skilfully traced by Roth. Equally interesting, however, would be an inquiry into the causes that produced the change. I do not know that the investigation would raise our estimate of the Veda, morally considered. Its allusions to the unseen world of the departed—to immortality and future blessedness, are exceedingly few. Allusions to future punishment, in consequence of sin in this life—are there any such? If not, it seems to me that the conception of hell, even when so gross as the horrible representations of the Puránas of the later Hindus, the Ardai-Viraf-Nameh of the Pársis, and the Korán of the Musulmans, exhibits a higher condition of the moral consciousness than we can trace in the Veda.

* *Die Sage von Sâm, und das Sâm-nâme.*

he deems interpolated. He has also published a treatise, containing the Zend text of the 19th Fargard of the Vendidad in Roman characters, a translation, and copious notes, critical and explanatory. This is an important part of the Zendavesta, and Spiegel's annotations touch on some weighty questions. One of these is the Pársí doctrine respecting *Zaruána Akarana.* The question has often been discussed whether the Pársís recognize a being called Zaruán Akaran as the supreme divinity, or whether Ahura Mazdá, the good principle, is so. In the treatise now under review, Spiegel strongly contends against the personality of Zaruán Akaran. The Zend words occurring in the 33rd section—*Dathat çpĕnto mainyus dathat Zrvánĕ Akarane,* are highly important in the decision of this question, as on them mainly has been based the view which Spiegel combats. Anquetil renders the passage thus :—"L'être absorbé dans l'excellence t'a donné, le tems sans bornes t'a donné"—that is : "The being absorbed in excellence has given thee ; time without bounds has given thee." Spiegel, on the other hand, thus translates : Cpĕnto-Mainyus (*i. e.* Ahura Mazdá) created it ; he created it in endless time." In a note on the passage he says that Anquetil's version, with all the consequences which he and others have deduced from it, is certainly false ; and that the opinion that endless time is in the Zendavesta exalted over Hormazd is thus left entirely without support. The views of Spiegel on this question agree with those of Müller, Brockhaus, and Roth ; and it is interesting in this connexion to observe that our modern Pársís in India coincide with them. They have been attacked, however, by Schlottman, in an article in Weber's *Indische Studien,** and in a commentary on the Book of Job. The latter work I have not seen, but the paper in the *Indische Studien* is now before me. The writer conceives that Zaruán Akaran corresponds with the Semitic Χρόνος—a deity found under various names among the ancient Babylonians, Phœnicians, and Arabians. Zaruan answers, according to Schlottman, to the Βῆλος ἀρχαῖος, Ahura Mazdá to the Βῆλος δεύτερος.† These two, he conceives, are not necessarily different : the first and second Bel are in certain cases identified, and, in like manner, Ahura Mazdá, considered as the absolute, the eternal, is Zaruán Akaran. Spiegel has written a

* Heft I. s. 364.

† This signification of the word Akaran has occasioned a good deal of discussion. Spiegel accedes to the translation of Anquetil, *without bounds*, which corresponds with the Pehlivi rendering, and is the prevalent one among the Pársís now. The objection to this rendering is that the word *kanár (boundary)* is not known in Zend. Roth, Brockhaus, and others, prefer the rendering *causeless, uncreated.*

full reply to the criticism by Schlottman.* He contends, with Müller, that in the proper Pársí system there is no place for Zaruán as the supreme deity, and that the dualism of the Pársís is not absolute, a superiority being still retained by Ahura Mazdá. This conception of Zaruán, then, must be later than the original system; and the testimonies of later Greek and Armenian writers on the point, however true regarding the Pársí system prevalent in their own day, do not apply to its earlier form. The existence at a later period of the idea of Zaruán as deified fate or destiny, Spiegel admits, as also the resemblance between this conception and the Babylonian one. The question then arises—Did the Pársís obtain the conception from their Babylonian neighbours? Possibly so; but we cannot pronounce positively,—the conception may have occurred spontaneously to the Pársís. So Spiegel; but, considering the close connexion between the Pársís and their neighbours on the west,—the Assyrians and Babylonians,—and considering the abundant evidence of the religious influence exerted by the latter two nations on the first, supplied by the recent discoveries of Layard and others, we can hardly hesitate to pronounce the notion of Zaruán not original, but borrowed from Mesopotamia.†

Another point of great importance in the interpretation of the Zendavesta is the doctrine of the resurrection. The doctrine of the resurrection of the body is the general belief of the modern Pársís, unless, perhaps, where, in country districts, their intercourse with Hindus has shaken their confidence in a tenet so much opposed to the prevalent Indian notion. We find the doctrine, also, in the Pársí later books, from the Bundeshne downwards. Anquetil thought he saw it also distinctly enunciated in the Zend books; and on his authority it was for a long time considered an integral portion of the Zoroastrian theology. A polemical use was eagerly made of the supposed fact by various Neologian critics; for example Gesenius, in his commentary on Isaiah xxvi. 9,‡ boldly asserts that the Jews adopted the dogma of the

* Zeitschrift der D. M. G. V. 221.

† A very difficult word, which is generally connected with Zaruán Akaran, viz. *vayi*, is rendered by Anquetil, although with some hesitation, (See on Vendidad, Farg. xix. p. 415, note,) *oiseau*, or *bird*, but is translated by Spiegel *sky*. Schlottman very pertinently refers to the winged figure in a circle that is often seen suspended over the head of the king in Assyrian and Persian monuments. Anquetil's "bird acting on high" certainly bears a remarkable resemblance to this symbol of deity.

‡ "Thy dead men shall live; together with my dead body shall they arise. Awake and sing, ye that dwell in the dust; for thy dew is as the dew of herbs; and the earth shall cast out the dead."—*Authorised English Translation.*

resurrection from the Zoroastrian theology.* M. Burnouf in 1840, in the pages of the *Journal Asiatique*, has discussed with great fulness and precision the meaning of the terms *yavaëcha yavatataëcha*, which Anquetil renders *until the resurrection*, and has proved that they have no such signification, but simply mean *for ever*. Spiegel, in his critical examination of the 19th Fargard of the Vendidad, has occasion to discuss nearly all the terms in which Anquetil finds the doctrine of the resurrection; and the conclusion at which he arrives is in accordance with that of Burnouf. Except for the testimony which Theopompos *perhaps* bears as to its existence, and the occurrence of certain Zend quotations which Spiegel finds in the Bundeshne which seem to bear on the subject, and which at least deserve investigation, we might safely enough assert that the doctrine of the resurrection was unknown before the Sassanian era.†

Spiegel unhappily does not quote the words of Theopompos, but refers to Plutarch, *De Iside et Osiride*, Chap. 47. The edition of Plutarch to which I have access is that of Reiske, (Lipsiæ, 1777,) which does not divide the treatise into chapters. I have carefully searched for the sentiments which Spiegel refers to, but in vain. Theopompos is quoted more than once; but the nearest approximation to the sentiment attributed to him which I can find is the following. Speaking of the final defeat of Ahriman, Ἀρειμάνιος or Ἅιδης, he says it is the opinion of the Magi *τοὺς μὲν ἀνθρώπους εὐδαίμονας ἔσεσθαι μήτε τροφῆς δεομένους, μήτε σκιὰν ποιοῦντας*—*i. e.* "Men will then be happy, neither requiring food, nor making a shadow." This has nothing to do with the doctrine of a resurrection.

Immediately preceding the quotation from Theopompos, Plutarch says that when Areimanios is destroyed it is believed "the earth will be plain and level, one mode of life and government will prevail, and men will be blessed, and all speak one language." This too is as wide as possible of the doctrine.

With regard to Zend quotations on the subject in the Bundeshne, we shall be happy to see Spiegel's comments upon them; but unless they

* "Die Juden dieses dogma aus der Zoroastrischen theologie anfnahmen, und an ihre Messianischen vorstellungen anwanden, wofür unsere stelle classisch ist."

† The important term *hakhshânê*, in the 19th Fargard, Sect. 86, which Anquetil renders *resussciter*, or *rise again*, Spiegel renders *auffordern*, or *call forth, summon*.—Theopompos was a contemporary of Alexander the Great. Should his evidence seem to prove the doctrine of the resurrection to have prevailed among the Pársís in his time, we might infer that probably they obtained it from the Jews in the sixth century B. C. But we shall hope to have a full examination of this important matter from Spiegel or some other Continental scholar before long.

can be referred to the Zendavesta proper, their appearance in such a *farrago* as the Bundeshne will prove little or nothing on the point in question. So far as evidence is at present available, the probability is exceedingly strong that the doctrine of the resurrection is of comparatively recent introduction into the Zoroastrian system.

I may take this opportunity of expressing my conviction that our Orientalists are not in general disposed to attribute so much influence to Judaism in the development of the Pársí system as the historical connexion between the Jews and Persians suggests as probable, and even necessary. The wide dissemination of Jews and Jewish opinions throughout the Roman Empire is an admitted fact, and in reference to their influence on the Roman mind Seneca uses the strong language *victoribus victi leges dederunt.** We have no reason to believe the influence of Judaism in Persia to have been less. Of its powerful action on the mind of Arabia I need not speak.

Another paper from the pen of Spiegel, entitled "The Second Part of the Yaçna, a Contribution to the History of the Text of the Zendavesta,"† is exceedingly interesting, as a vigorous attempt to form some judgment regarding the relative antiquity of the chief portions of the Zend books. As yet we are wholly at a loss to fix anything like a date connected with the Zendavesta. Shall we refer it bodily, with the Pársís, to the age of the mythical Gushtasp? Shall we, with some who still adhere to Vans Kennedy's opinion, make out the whole to be an impudent forgery, committed since the overthrow of the Persian kingdom by the Muhammadans? Or shall we refer the compilation of the Zendavesta to the Sassanian epoch? And, in that case, may not fragments at least of books, composed some centuries earlier, have found a place in the collection? Such questions may be asked, but no satisfactory reply has as yet been possible. In the paper we now refer to, Spiegel mentions that several years ago he pointed out the fact that in the Yaçna we have two distinct dialects, which must be referred to two different ages, or else localities. This opinion has been confirmed by his more recent studies, and the paper now before us gives us the grounds of his belief. We cannot in these pages enter into the grammatical details which he investigates, but the general summary with which he concludes his paper will be read with interest:—

"We are now prepared to attempt an arrangement of the different portions of the Zendavesta in the order of their antiquity. First, we place the second part of the Yaçna, as separated in respect to the

* De Superstitione.

† Indische Studien, I. 303.

language of the Zendavesta, yet not composed by Zoroaster himself, since he is named in the third person; and indeed everything intimates that neither he nor his disciple Gushtasp was alive. The second place must unquestionably be assigned to the Vendidad. I do not believe that the book was originally composed as it now stands,—it has suffered both earlier and later interpolations; still, its present form may be traced to a considerable antiquity. The antiquity of the work is proved by its contents, which distinctly show that the sacred literature was not yet completed.

"The case is different with the writings of the last period, among which I reckon the first part of the Yaçna, and the whole of the Yeshts. Among these a theological character is unmistakeable, the separate divinities having their attributes and titles dogmatically fixed.

"Altogether, it is interesting to trace the progress of religion in these Pársí writings. It is a significant fact that in the oldest, that is to say the second part of the Yaçna, nothing is fixed in the doctrine regarding God. In the writings of the second period, that is in the Vendidad, we trace the advance to a theological, and, in its way, mild and scientific system. Out of this, in the last place, there springs the stern and intolerant religion of the Sassanian epoch.

"Closely related to the Persian system in its origin, yet how totally different in its development, has been the religious system of India! While the Pársís learned to venerate every syllable of their sacred books, we find in India, as soon as theological exposition commenced, an allegorizing spirit busily at work, to fashion anew the old materials which were no longer in accordance with the spirit of the age. Thus, in the course of generations, we find that the old nature-worship of the Vedas has been succeeded by a fantastic system, so utterly unlike the earlier that no one, looking at the later development, could possibly have conjectured the original form."

Another important work of Spiegel's is a "Grammar of the Parsi Language."* By the term *Parsi* language Spiegel denotes a dialect that has not hitherto received a name—one intermediate between the Huzvaresh or proper Pehlivi, and the modern Persian. We pass over all grammatical minutiæ, and attend to some general characteristics of the language. In an introduction of fifteen pages, our author enters into a discussion of the term *Pá-zend*, which leads to some useful results. There has been considerable doubt as to the real meaning of this frequently-recurring term—some denoting by it a book, others a language.

* Grammatik der Parsi Sprache, nebst Sprachproben von Dr. F. Spiegel. Leipzig: 1851.

That Pá-zend was the name of a book was the view of Hyde, the English scholar who first successfully cultivated the study of the ancient Persian religion. He adopted this opinion from the Arabic and Persian writers with whom he was familiar,—such being the uniform testimony of the Persian lexicon the Burhán-i-Qáti, and other eastern authorities. On the other hand, Anquetil, in his great work, and a special treatise on the language of ancient Persia, denominates the oldest language of Persia, and the language of the ancient sacred books, as Zend. He knew that the term was used by the Pársís themselves, and various eastern writers, to designate a book; but this he conceived to be an error. Anquetil, says Spiegel, is mistaken. Recent investigators, such as Burnouf and Müller, hold that the terms Zend and Pá-zend denote books, not languages. Burnouf remarks that the term Zend does not occur in the Zend text. He understands it to be derived from *zantu*, a town, and properly to signify the book of the people, or of the towns,—a sense which he compares with the Indian name, *devanágarí*, of the Sanskrit character.

Spiegel is convinced that by the term *Avesta* are properly understood the sacred writings; by *Zend* the commentary, or rather the translation of this; and by the term *Pá-zend* the glosses or annotations on the translation. The signification of Avesta is, as shown by Müller in his essay on the Pehlivi, *text*. Spiegel has no etymology of the term Zend which satisfies himself. The Sanskrit seems to afford little aid; and, as the word is of comparatively later origin, he deems it possible that some of the Semitic tongues may yet supply the desideratum.

It may be doubted if the opinion expressed by Spiegel regarding the meaning of the terms Zend and Pá-zend will stand. The usage of our modern Pársís is rather conflicting, and, perhaps, not much can be based upon it. They certainly often apply the term Zend to the language of their sacred books; but the more learned among them apply it primarily to the *character* or *writing* of the sacred books, and hence, secondarily, to the language. By Pá-zend the Pársís seem to understand the *translation* of the sacred text, which is generally interlinear.

In the Zendavesta, or, as Spiegel would call it, the Avesta, there are three languages: 1st, the so-called Zend; 2nd, the Huzvaresh,* or proper Pehlivi; and, 3rd, the language hitherto unnamed, which Spiegel now analyses, and denominates Parsi. In the last language are composed various translations and independent pieces,—the Aferins, the Patets, the translation of Minokhired, &c. This dialect is intermediate

* Huzvaresh, *i. e.* Huzaothra, *bonum sacrificium.*

between the Pehlivi of the Sassanian epoch and modern Persian, but with nearer relationship to the latter. We may, with probability, refer it to the time that intervened between the conquest of Persia by the Arabs, and the birth of Firdausi. It has been noted that Firdausi writes in the Deri dialect of Persia; and between the Deri and the "Parsi" of Spiegel there is considerable resemblance. Mohl would refer it to the eastern parts of Persia.

But the most important of all Spiegel's labours in Zend literature is his edition of the Zendavesta which is now passing through the press.* The first part, containing, in 112 pages, ten fargards of the Vendidad, is now before me: it is most beautifully got up,—paper and printing do great credit to the Imperial Press of Vienna, from which the work is issued. The original text is to be followed by the Huzvaresh (Pehlivi) translation, a copious list of various readings, and a German translation.

We shall be laid under the deepest obligations both to this zealous scholar, and to our learned friend Mr. Westergaard, of Copenhagen, who is also busy engaged in carrying an edition of the Zendavesta through the press, accompanied by what will be a great recommendation to it among our Indian Pársís, an *English* translation. The simultaneous appearance of two translations will be an advantage. So dark a work as the Zendavesta cannot be fully elucidated by the labours of one investigator, however learned and laborious; and the Danish and German critics will profitably be studied together.

Reference has been more than once made in the above pages to the modern Gujarátí translations of the Zendavesta. By far the best known of these is that of Frámjí Aspandiárjí, an edition of which was lithographed by our Society in 1842 and 1843, and copies distributed to the chief colleges and learned societies of Europe. It may be an interesting thing to compare the versions of the 19th Fargard of the Vendidad as given by Anquetil, Spiegel, and Frámjí. I shall here subjoin literal English renderings of the three versions. In translating Frámjí's almost untranslatable Gujarátí, I have had the kind assistance of my learned friend Mr. Dhanjíbháí Frámjí, whose unwearied labours in Zend and Pehlivi literature are well known to the Society, and whose forthcoming work we hail as an important contribution to the elucidation of the subject.

* Avesta; die Heiligen Schriften der Parsen. Zum ersten Male im Grundtexte sammt der Huzvaresch uebersetzung herausgegeben von Dr. Friedrich Spiegel, &c. Leipzig: 1851. (*Avesta; the Sacred Writings of the Pársis. Now first edited in the original text, with the Huzvaresh version, by Dr. Frederick Spiegel, &c.* Leipzig: 1851.)

I.—*Spiegel's Translation of part of the 19th Fargard of the Vendidad.*

1. From the northern region, from the northern regions, rushed Agra Mainyus, he who is full of death, the Daeva of the Daevas.
2. Thus spoke this malevolent Agra Mainyus, who is full of death :
3. Drukhs ! run, kill the holy Zoroaster.
4. The Drukhs ran round him, the Daeva Buiti, the perishable, the deceiver of mortals.
5. Zoroaster pronounced the prayer Ahuna-vairya, *Yatha ahu vairyo*, &c. May they praise the good waters of the good creation, and honour the Mazdayaçnian law.
6. The Drukhs ran troubled from him, the Daeva Buiti, the perishable, the deceiver of mortals.
7. The Drukhs answered him, [Ahriman,] Tormenting Ahriman !
8. I see not death on him, on the holy Zoroaster.
9. Full of splendour is the holy Zoroaster.
10. Zoroaster saw in spirit : the bad malevolent Daevas consult about my death.
11. Zoroaster raised himself, Zoroaster advanced ;
12. Not injured by Aka-mano's very tormenting questions.
13. Holding darts in his hand—which are of the size of a Kata—the holy Zoroaster ;
14. Which he had received from the Creator, Ahura Mazdá.
15. To hold them on this earth, the wide, round, difficultly-traversed [earth], in great strength, in the dwelling of Pourushaçpa.
16. Zoroaster addressed Agra Mainyus : Malevolent Agra Mainyus !
17. I will slay the creation which has been made by the Daevas ; I will slay the Naçus whom the Daevas have made ;
18. I will slay the Paris to whom they pray (?) until Caoshyanç [viz. the useful] shall be born, the victorious, out of the water Kançaoya.
19. From the eastern region, from the eastern regions,
20. Him answered Agra Mainyus, who has made evil productions :
21. Kill not my productions, oh ! holy Zoroaster !
22. Thou art the son of Pourushaçpa, and hast life from a [mortal] mother.
23. Curse the good Mazdayaçnian law, acquire happiness, as Vadhaghna, the ruler of the regions, acquired it.
24. To him rejoined the holy Zoroaster :
25. I will not curse the good Mazdayaçnian law—
26. Not though bones, soul, and means of life shall be separated from each other.
27. To him rejoined Agra Mainyus, who has made bad productions :
28. Through whose word wilt thou slay ; through whose word wilt thou destroy ; through whose good weapons, against the productions of me, Agra Mainyus ?
29. To him rejoined the holy Zoroaster :
30. Mortar, shells, homa, and the words which Ahura Mazdá has spoken—
31. These are my best weapons ;
32. Through this word will I slay ; through this word will I destroy ; through these weapons are we victorious, oh ! wicked Agra Mainyus !

33. Cpento Mainyus created it; he created in endless time.
34. The Amesha-spenta created it, the good rulers, the wise.

II.—*Frámjí Aspandiárjí's Translation.*

1. From the northern quarter, the northern quarter, ran fast the wicked Mino, full of death, Dev of Devs.
2. Thus said the malevolent, the wicked Mino, full of death: Daruj!
3. Run quickly to injure the holy Zoroaster.
4. The Daruj ran upon him, named But Dev, death, he who walks in secret, the deceiver.
5. Zoroaster loudly prayed the Ahunavar, the pure water was much praised of the Vehedáoti, [according to] the Masdiasnian religion, Faruárâne.
6. The Daruj, distressed, ran away back, the Dev But, of death, he who walks in secret, the deceiver.
7. The Daruj replied to the destroyer, the wicked Mino:
8. Not upon that death do I see Sapetmán Zoroaster.
9. Full of light is holy the Zoroaster.
10. Zoroaster saw in his mind that the Dev, the infidel and malevolent, was asking for his death.
11. Zoroaster stood up—Zoroaster moved forward,
12. To distress the Ákuman [by] hard questions.
13. The holy Zoroaster, holding in his hand the excellent [instrument], namely the Noghere,* was in the house;
14. Received from Dádár Hormazd.
15. That [*quaere*, by which?] he kept the earth [under his] protection, far away [from the Dev] hard, hard gold,† in the house of Pouroshasp.
16. Zoroaster quickly rose‡ [on] the wicked Mino, the malevolent, wicked Mino:
17. Let me kill the creation of the Dev, given, let me kill Nasas, given by the Dev;
18. Let me kill the worshippers of the Paris, for [they are] idolaters, for soon will be born the beneficial, the successful, from the water Keáns.§
19. From the eastern quarter, from the eastern quarter,
20. Replied the malevolent, wicked Mino:

* A stick with nine knots.

† This seems nonsense. The commentary slurs over the difficulty, and says nothing of *gold*.

‡ This sense is so much out of place, that perhaps there is an error of transcription.

§ "Let me kill the respecters of the Paris, and the idolater, that is, the worshipper of images, and let my disciples also kill you, and afterwards the victorious and beneficial will arrive from the river Kánse: he too will kill you, that is my sons Hoshedar, and Hoshedarmaha, and Sosioesh. These three sons will be born from the river Kánse, and they shall kill you for your own deeds, they shall kill you for your actions."

The above is Frámjí's commentary on Sects. 18, 19. The passage is important, as connected with Pársí eschatology. The foolish and disgusting tale told in the later books regarding the three sons of Zoroaster who are still unborn will be seen in Anquetil's Zendavesta, Tom. I. Part 2, p. 46; and Tom. II. p. 420. Frámjí evidently refers to it in the above comment; but his literal version is pretty correct. Anquetil's version (see below) is a commentary, not a translation.

21. Do not kill my creatures, holy Zoroaster.
22. Thou art son born from Pöuroshasp.
23. Abandon the excellent Masdiasnian religion, and attain virtue, like Zohàk, the king.
24. Said to him in reply Sapetmán Zoroaster:
25. I will not abandon the excellent Masdiasnian religion;
26. Not while I have body, and soul, and life, will I turn (apostatize).
27. Said to him in reply the malevolent, wicked Mino:
28. By what word wilt thou destroy; by what word wilt thou remove; by what excellent instrument [wilt thou destroy] the creation of me, wicked Mino?
29. Replied to him Sapetmán Zoroaster:
30. By havanim, tasto,* haom, and the word spoken by Hormazd.
31. My instrument is excellent, (high).
32. (By) this word I will throw off, by this word I will force [you] to retire, by this instrument made holy, oh! malevolent, wicked Mino!
33. Given by Sapena Mino; given by† boundless time, (Zamána Akanár).
34. Given by the excellent Amshaspands, pure masters, givers of purity.

III.—*Anquetil's Translation.*

1. It is from the north quarter, various places which are to the north, that Ahriman, full of death, that chief of the Dews, runs.
2. He runs continually, that Ahriman, full of death, master of the bad law.
3. That Daruj runs over the world, and ravages it, oh! pure Zoroaster!
4. That Daruj goes everywhere: it is he that is the Dew, author of evils, who ravages, torments, and teaches the bad law.
5. (In the commencement) I pronounced the Honover, oh! Zoroaster (saying): It is the desire of Ormusd, &c. I made izeshne to the pure water, which has been given pure: I practised the law of the Mazdeiesnans.
6. That Daruj, enfeebled and without force, *(sans forces,)* returned behind, he who is the Dew, author of evils, who ravages, and teaches the bad law.
7, 8. That Daruj, that proud Ahriman, wished to answer me.
9. He had not seen, oh! Sapetmán Zoroaster, the holy Zoroaster full of glory.
10. That infernal Dew, author of the bad law, saw in thought Zoroaster, and was annihilated by it.
11, 12. (He saw) that Zoroaster would have the superiority, and would march with a victorious pace; he saw that cruel Akuman, the source of evils, would be destroyed.
13. He who has long arms, and an extended body, oh! holy Zoroaster!
14. Without having regard to the great Ormusd, the just judge,
15. (Traversed) the extended earth, ran over its length and breadth, and after having passed (like) a bridge which extends far along, he went into the strong place which Poroshasp (inhabited).
16. Zoroaster was stronger than Ahriman, that Ahriman, author of the bad law.
17. He struck the people given by that Dew, he struck (the Daruj) Nesosh, given by that Dew.

* Figures of these sacrificial vessels will be found in Anquetil's Zendavesta, Tom. II. p. 533; and the Rev. Dr. Wilson's "Pársi Religion," p. 231.

† In his translation Frámjí makes this *to*; in his commentary *by*.

18. The Paris and their designs shall be destroyed by him who will spring from the fountain, by Sosioesh the conqueror, (who will arise) from the water Kansé.
19. By Osheder (bami), and by Osheder (mah), who (will come) from the quarter (where is the water Kansé).
20. Then Ahriman, master of the bad law, said:
21. Destroy not my people, oh! pure Zoroaster!
22. You, son of Poroshasp, who art born of her who has borne you.
23. The pure law of the Mazdeiesnans shall be practised (in the world) when the pure chief of the provinces shall appear.
24. I answered him, oh! Sapetmán Zoroaster:
25. If thou do not embrace the pure law of the Mazdeiesnans,
26. The bones, the soul, the members (of thy productions) shall not grow again.
27. Ahriman, that master of the bad law, said to me on that:
28. What is that word which is to give life to my people, which is to increase it, if I regard it with respect, if I make vows with that word?
29. I answered him, oh! Sapetmán Zoroaster:
30. Pronounce the word of Ormusd, with the hâvan, with the salvers, and with the hom.
31. It is I who (by that word) augment Behesht.
32. It is in regarding that word with respect, in making vows with that word, that thou shalt have life and happiness, Ahriman, master of the bad law.
33. The being absorbed in excellence has given thee, time without bounds has given thee.
34. He has also given with greatness the Amshaspands, who are pure productions and holy kings.

It will be seen, from a comparison of the above three versions, that the German Professor and the Pársí Dastur, on the whole, well agree with each other, while the French rendering deviates so widely from both, as seldom to present the same sense as theirs throughout a single sentence. The explanation of the coincidence between Spiegel and Frámjí is that both are nearly correct in their understanding of the Zend, and both attach much importance to the Pehlivi version. Anquetil's deviations, on the other hand, are as inexplicable as they are capricious.

These remarks are lengthening out more than I desired, and I shall say less than I once intended on our modern Pársí versions.

1. The one of greatest importance is that of Frámjí Aspandiárjí. In the preface to the work it is mentioned that it was compiled at the request of the late Frámjí Cawasjí, Esq., a man whose name stands honourably distinguished among the Pársís both for philanthropy and enlightenment. The translation was commenced in 1823, and finished in 1825. The translator followed chiefly the Pehlivi version. The work contains the Zend text written in Gujarátí characters, an interlinear literal version into Gujarátí, and a freer rendering, more a com-

mentary than a version. When it was finished it was submitted for revision to four learned Pársí Dasturs, viz. Mulla Firuz, (the well-known Editor of the *Desatir*, and a man highly complimented by Sir John Malcolm,) Edaljí Dárábjí Sanjána, Jamshidjí Edaljí, and Jámásjí Edaljí. Meetings were held by three of the Dasturs now mentioned, for the purpose of examining the work—Edaljí Dárábjí for some cause or other absenting himself. The translation was revised, and, when approved, manuscript copies were made, and to some small extent circulated in the Pársí community.

Disputes connected with the calculation of time have run high among the Pársís; and although Frámjí Aspandiárjí personally belonged to the Rasamí party, his patron was the leader of the other; and for this reason, as many Pársís say, his work has been violently attacked by one party. When a proposal was recently submitted to our Society at the request of Dr. Graul, of Leipsic, in which Dr. Brockhaus (of whose valuable labours in Zend investigation we have spoken above) was understood to concur, that Frámjí's version should be rendered into English, strong remonstrances were made by some of the Pársí community against the translating of "an erroneous book." Unhappily, while declaiming against its errors, they have substituted nothing better in its place.

2. It was indeed asserted that a translation of the Zendavesta had been made by Edaljí Dárábjí Sanjána. A manuscript copy of this was actually exhibited to the Society, which contained four fargards of the Vendidad, the whole very carefully written out, and containing the Zend original in its own character, the Pehlivi version in its character, and a Gujarátí version, with occasional notes. If the entire Zendavesta, or even the entire Vendidad, has been completed in the same style, the work would be most valuable; and the Pársí Panchayet, to whom it is understood to belong, certainly owe it to their own character to render the book accessible. Why should not some Pársí *millionaire* publish an edition of it?

3. Edaljí Dárábjí Sanjána published in 1811 an edition of the Khurdah Avesta, the Zend in Gujarátí characters, and accompanied by a Gujarátí version, 12mo. pp. 799. A second edition of this work, enlarged, 8vo. pp. 338, appeared in 1845.

4. The Herbad Edaljí Dastur Dárábjí Asájí published in 1833 the Avá Yast, Zend in Gujarátí characters, with a Gujarátí version, 8vo. pp. 234.

5. Aspandiárjí Frámjí, the son of Frámjí Aspandiárjí, published

in 1849 an edition of the Yaçna, Zend in Gujarátí characters, with a Gujarátí version, quarto, pp. 383.

We shall, however, soon have the pleasure of receiving the English translation of Professor Westergaard, and the German one by Professor Spiegel; and the cause of Oriental investigation will not greatly suffer even though the labours of such learned men as Edaljí Dárábjí should by a most mistaken policy continue to be withheld from the public. The mystic oracle, long silent, will soon be vocal, and even intelligible. Should such men as Westergaard and Spiegel read these lines, they will accept of our thanks for the great work they are performing. Their labours have a far higher than an antiquarian, a philological, or a philosophic value. In the present condition of the Pársí community they will exert a practical influence of a most important character; they will powerfully tend to recall to consciousness the slumbering mind of an interesting race,—the remnant of a once mighty and influential people,—lead them to reflection on the most momentous and arousing of all questions, and thus co-operate with still higher agencies in giving freedom to intellectual and moral energies which have been for ages enslaved.

ART. III.—*On the conflicting views of European Scholars as to the Races inhabiting Polynesia, and the Indian Archipelago; and as to the Languages spoken by them.* By the Hon'ble Sir ERSKINE PERRY, President.

Presented 1st May 1852.

THE receipt of a work from England by my relative Mr. John Crawfurd,* which has probably not been yet seen by my colleagues, induces me to bring before the Society the state of a very interesting question, which has been much battled by European Scholars, and on which information may still be gathered in the East, viz. as to the races of mankind, and the languages spoken, in Polynesia and the Indian Archipelago. It is well known that over that vast region of the earth's surface, extending from what may be called, generally, the East Coast of Africa on the one hand, to the West Coast of America on the other, but more definitely from Madagascar to Easter Island in the Pacific Ocean, and from Formosa, on the coast of China, to New Zealand, including the Indian Archipelago, the Nicobars and Andamanns in the Bay of Bengal, and the Maldives and Laccadives on the Malabar Coast, two races of men, distinctly severed from each other by a marked variance of colour, exist. In some of the innumerable islands scattered over this vast region, the brown race is to be found exclusively, in others the black race, while in certain localities the blacks are to be found driven into the rugged and wild interior, and the brown race is in occupation of the coast, and of the choicer parts of the territory. An example very near at hand of this distribution may be seen in the Nicobars and Andamanns, the former† of which is occupied by the brown, the latter by the black race exclusively, and also in the Malacca peninsula, where the Negroes are to be found only in the mountainous interior.

* Grammar and Dictionary of the Malay Language, with a Preliminary Dissertation. 2 vols. 8vo. 1852.

† I saw a notice in a Calcutta newspaper within the last two or three years of a black race as inhabiting the Nicobars also, but I have lost the reference.

Amongst all these tribes a very well established connection between their languages has been detected, which the judicious Marsden was the first to point out in detail, and which he, as well as Crawfurd, considered to have originated in a great Polynesian language of some extinct race. But since the publication of the remarkable posthumous work of William von Humboldt on the Kawi language of Java,* the generally received opinion has been that the brown races at least, as well of the Archipelago as of the innumerable islands of the Pacific, and the different languages they speak, are all identical in origin. That distinguished philologist gives such an interesting view of his theory in his preliminary dissertation "*On the Varieties of Human Language, and its Influence on the Mental Development of Mankind,*" that I am tempted to make a long extract from a translation I had prepared for an educational purpose; but, as the matter is deeply interesting to Indian scholars, and the work has not yet appeared in an English dress, I trust that the Society will not deem it unsuitable for this place:—

"The races of Malay origin, with respect to locality, government, history, and, above all, language, are perhaps more singularly connected with races of different cultivation than any other people in the world. They inhabit only islands and island groups, but these extend over so wide a range as to afford unmistakeable testimony to their early acquaintance with navigation. Their settlement on the Continent at Malacca scarcely deserves to be mentioned here, as it is of modern date, and proceeded from Sumatra, and that on the coasts of the China Sea, and of the Gulf of Siam, at Champa, was a still later occurrence. With these exceptions, we are unable to trace, with any certainty, even in the most remote history, the existence of Malays on the mainland. If from these races we separate those who in a strict sense deserve the name of Malays, and who, according to undeniable grammatical researches, speak closely allied tongues, easily intelligible to one another, we shall find them settled (only mentioning those points where the inquiry into languages has had sufficient materials to work on) in the Philippines,—where the language is to be found in the richest development of forms, and in its most original condition,—in Java, Sumatra, Malacca, and Madagascar. A large number of words, however, of unquestionable relationship, and even the names of a considerable number of islands, betoken that the islands in the neighbourhood of the above localities are peopled by a similar race, and that even the more strictly so-called Malay language extends itself over all that portion of the South Pacific

* Ueber die Kawi-Sprache auf der Insel Java nebst einer Einleitung, &c. 3 vols. 4to. Berlin: 1838-39.

which reaches from the Philippines southerly to the West Coast of New Guinea, and, more westerly, to the chain of islands which joins the eastern point of Java, and runs up between Java and Sumatra to the Straits of Malacca. It is a matter for regret that the large islands of Borneo and Celebes, to which probably all that has been said above may apply, have not yet had their languages sufficiently examined to allow of any conclusion being drawn on grammatical grounds.

"To the eastward of the zone here drawn of the pure Malay language, from New Zealand to Easter Island, thence northerly to the Sandwich Islands, and then back again westwards to the Philippines, a race of islanders is to be found, who display most unquestionable traces of an old connection in blood with the Malays. This is proved by the number of similar words, and essential coincidences of physical structure, in the languages whose grammar we know intimately, such as those of New Zealand, Tahiti, the Sandwich Islands, and Tongu. A like similarity is to be found in manners and customs, especially where pure Malay customs are recognisable, unaltered by Indian usages. Whether the races to the north-west in this part of the Pacific belong wholly or in part to the latter division, or to the Malays in the strict sense; or whether they form a connecting link between the two, cannot yet be decided with our present materials, as even the researches which have been set on foot with respect to the language of the Mariana Group have not yet been made public. The whole of these races possess social institutions sufficiently complicated to make it improper to exclude them wholly from the class of civilized nations. They have a well-established, and by no means simple system of government, of religious doctrines, and of usages, and some of them possess a species of spiritual government; they display skill in various arts, and are bold and experienced seamen. We find amongst them in several spots the remains of a sacred language, unintelligible even to themselves, and their custom of recalling formally obsolete expressions into life on certain occasions speaks not only to the richness, age, and depth of the language, but also to their powers of observation as to the effect of time in modifying circumstances. With all this they allowed, and still partly allow, barbarous practises inconsistent with civilization.* They appear never to have acquired the art of writing, and, consequently, are deprived of all that literature which is founded upon it, although they are by no means wanting in fanciful legends, impressive eloquence,

* Mr. Crawfurd mentions a somewhat cultivated race in Sumatra, well acquainted with letters, who appear to be the only literary cannibals recorded in history.—E. P.

and poetry in defined rythmical cadence. Their languages, however, have not sprung out of any corruption or change of the Malay tongue of the narrower zone, but we may rather trace in them an unformed and original condition of the latter.

"Along with the race thus described in the two divisions of the Great Southern Archipelago, we meet, on some of the islands, with people who, from their appearance, must be attributed to a wholly different stock. Both the Malays in the stricter sense, and the more eastern inhabitants of the South Sea, belong without doubt to the same human family, and they form, if one makes an accurate division by colours, the class passing from the light browns into white. The races of whom we are now speaking approximate, by their black skin, occasionally by their woolly frizzled hair, and by their peculiar features and build, to the African Negro, although, according to the most trustworthy evidence, they are nevertheless essentially different, and can by no means be considered as the same race. Writers on these countries, in order to distinguish them from Negroes, call them either Negritoes or Austral-Negroes, and but few of them exist. Both in the islands inhabited by the Malay races, and in the Philippines, they usually occupy the middle of the island, and inaccessible hills, to which they appear to have been gradually driven by the more numerous and powerful white race. We must carefully, however, distinguish them from the Haraforas, or Alfuris, the Turajos of Celebes, who are to be found in Borneo, Celebes, the Moluccas, Mindenao, and some other islands. These latter appear to have been driven out in a similar manner by their neighbours, but belong to the light brown race; and Marsden attributes their disappearance from the coast to Mahomedan persecution. In wildness they approximate to the black race, and they constitute a population of uniformly low development. Other islands, amongst which are some large ones, like New Guinea, New Britain, New Zealand, and some of the Hebrides, contain these Negro races only, and the inhabitants of the large continents of New Holland and Van Dieman's Land, so far as there has been hitherto opportunity of becoming acquainted with them, belong to the same race. But although this race in all the localities here indicated displays general marks of similarity and relationship, it is by no means thoroughly established how far essential differences of race exist among them, for their language has not yet been investigated so as to satisfy the exigencies of a thorough grammatical inquiry. We have only the materials collected by the Missionary Trelkeld as to one race in New South Wales, by which we are enabled to form any judgment as to its organic and grammatical

structure. The race everywhere distinguishes itself by a greater wildness and barbarism than appears in the lighter races; and the differences herein relate solely to their greater or less intercourse with the latter. The inhabitants of New Holland and Van Dieman's Land appear to stand on the lowest grade of civilization which has ever yet been occupied by mankind. It is a remarkable phenomenon to meet, even on the peninsula of Malacca, the light and dark races in contact with one another, for the Semangs, who occupy part of the mountain range of that country, are by most unquestionable testimony a woolly-haired Negrito race. As this is the only point of the mainland of Asia where the fact occurs, it is unquestionable that immigration must have taken place here at a comparatively recent period.* Among the lighter races, also, as the Malay expression *orang benna* (men of the country) appears to prove, more than one immigration seems to have occurred. Both occurrences only show, therefore, that the same kind of connection between countries at different periods brings about similar historical facts, and, consequently, to this extent there is nothing remarkable in them. In reference to the state of culture of the different races of mankind in this Archipelago, however, any explanation by means of colonization becomes deceptive. To enterprising nations, the sea offers rather a means of easy connection than of distinct separation, and the general diffusion of bold active seamen, like the Malays, explains itself in this way by short trips from island to island, sometimes intentionally made, and sometimes by their being driven away through the violence of the prevailing winds; for activity, expertness, and knowledge of sea-craft, are not characteristics of the proper Malay only, but are to be found amongst the whole of the light brown race. I need only mention here the Bugis of Celebes, and the South Sea Islanders. But if this description of the Negritoes, and of their diffusion from New Holland to the Philippines, and from New Guinea to the Andamanns, is correct, these races must have deteriorated more than is usually supposed from a more civilized condition, and have become wild. Their present condition rather favours the hypothesis, which is not in itself improbable, of revolutions of nature, old traditions of which still exist in Java, by which a populous continent

* Yet it is strange that Herodotus records amongst the ranks of Xerxes' army a Negro race from India, who appear to have been brigaded with the Hindus, and who, says the father of history, were only distinguished from the African Negro by their language, and by not having woolly hair. See Lassen's Alterthumskunde, vol. i. where he points out other evidence of an aboriginal black race in India; and the subject seems worth pursuing.—E. P.

became broken up into the present island groups. Men, like ruins, might, so far as mankind could survive such convulsions, have remained on the scattered island tops. Both of these explanations, perhaps, if united, so as to consider the dislocation by the powers of nature as occurring during a lapse of centuries, and distinguished from the connection through human colonization, might perhaps afford us some sort of account of the various races which now appear.

"Tanna, one of the Hebrides, but a word of Malay origin, New Caledonia, Timor, Ende, and some other islands, possess a population which is left doubtful after inquiry whether we are to reckon it, with Crawfurd, as a third race, or, with Marsden, as a mixture of the two others; for the inhabitants, in their physical make, woolliness of hair, and colour of skin, occupy a middle place between the light brown and black races. If, at the same time, a similar affirmation can be made as to their language, this circumstance would tell authoritatively for their being a mixed race. There still remains an important question, but one very difficult to decide from the materials at hand, viz. how far older and more intimate mixtures of the white and black races have occurred in these countries, and how far gradual changes may thereupon have ensued in language, and even in colour and growth of hair, the woolliness of which, moreover, in some localities, is cultivated as an ornament. To judge correctly of the Negro races in their pure form, we must always commence with the inhabitants of the Great Southern Continent, as between these and the brown races no direct contact is conceivable, and according to their present condition it is difficult to suppose any kind even of indirect connection. The remarkable fact still remains, that many words in the languages of these races, although we certainly possess only a few of them, bear an evident likeness to the words of the South Sea Islands.

"Amid these geographical relations, in some instances amounting to close neighbourhood, certain Malay races adopted Indian civilization to such an extent that perhaps no similar example is to be found of a nation undergoing such a complete infusion of the national spirit of another race, without losing its own independence. The phenomenon as a whole is very intelligible. A large part of the Archipelago, and the most attractive from its climate and fertility, lay at a very short distance from the great continent of India—opportunities and points of contact were consequently abundant. But where such occurred, the preponderating influence of a civilization so ancient, and so diffused through every branch of human activity as the Hindu, could not fail to attract towards it other nations of active and impressionable temperaments.

This was rather a moral than a political revolution. We recognise it in its consequences in the Hindu elements, which undeniably present themselves to view in a certain range of Malay races; but how did this mixture arise? On this point, even amongst the Malays, as we shall see, nothing but obscure and doubtful traditions exist. If inroads of powerful races and extensive conquests had produced this state of things, clearer traces of such political events would have been preserved. Intellectual and moral causes work, like nature herself, in silence, and their operation is similar to the growth of a seed, eluding observation. The *modus operandi* in which Hinduism struck root amongst the Malay races proves that as a mental spring of action it excited the imagination, and became powerful through the impressions of wonder which it produced in races susceptible of culture. In India itself, so far as I know, we find no mention of the South-eastern Archipelago in Hindu history or literature. Even if Lanka were perhaps considered to extend further than the limits of Ceylon, this was only dark and uncertain surmising, or mere poetical license. From the Archipelago itself, on the other hand, as we may well conceive, nothing proceeded which could have any influence on the mainland. It was India that exerted a substantial influence, and perhaps even by colonization, which was not intended to keep the mother country in view as a home, or to preserve relations with it. Reasons for establishing settlements might be various. How far Budhist persecution might have co-operated I shall have to discuss hereafter.

"But to explain properly the mixture of Malay and Hindu elements, and the influence of India on the whole of the Indian Archipelago, we must discriminate between its different modes of operation, and thereby commence with that which, early as it may have began, has continued to the latest times, and consequently has left the clearest and most indelible traces. It is not only the influence of a spoken foreign language which in this case, as in all mixtures of nations, operates powerfully, but also the whole of the mental culture which springs out of it. This phenomenon is unquestionably apparent in the introduction of Indian language, literature, myths, and religious philosophy into Java. The whole purport of the following work is to discuss this question, but principally with reference to language,—I therefore must content myself here with this mere allusion. This species of influence affected only the Indian Archipelago, properly so called, and the Malay zone in its stricter sense; but possibly not even the whole of the latter, and certainly not to an equal extent. The focus was so undoubtedly Java, that we may reasonably doubt whether that island was not the

immediate source from which it extended itself over the rest of the Archipelago. Independent of Java, we find, however, distinct and complete proofs of Indian civilization amongst the proper Malays and Bugis of Celebes. A true literature, from the essential elements of the formation of language, is only capable of existing contemporaneously with a written character which is in daily use. It is an important fact, therefore, for the mental development of the South-eastern Archipelago, that just that portion of the island group which has been designated as strictly Malay possesses an alphabetic character. A distinction not to be overlooked, however, here occurs. The alphabetic character in this part of the world is Indian. This arose naturally from the intellectual relations of these countries; and is visible in most of their alphabets, with the exception perhaps of the Bugis, in the similarity of the letters, not to mention their arrangement to designate sounds, which undoubtedly does not furnish any decisive proof, as it might have been adopted subsequently to a foreign alphabet. Nevertheless, a complete similarity, with merely an adaptation to the simpler phonetic system of the indigenous tongues, occurs only in Java, and perhaps at Sumatra. The character of the Tagalis and of the Bugis is so different, that it may be regarded as an example of alphabetic invention. In Madagascar the Arabic character has planted itself, as the Indian has done in the centre of the Archipelago. At what period this occurred is uncertain. And there does not appear to be any trace of an original character which it displaced. The use of the Arabic character amongst the Malays proper decides nothing as to their intellectual relations, which we are now discussing, for it is notoriously a modern introduction. I have already mentioned the total want of all writing in the South Sea Islands, and amongst the woolly-haired races. The traces of Hinduism which we have here in sight are so distinct that we may recognise them everywhere without difficulty, and we can distinguish them as foreign elements. No true intermixture or amalgamation is here discernible, but a mere mosaic union of foreign and native. So far as relates to manners and customs, we may clearly recognise in Indian antiquity the foreign words in the Sanskrit descended to us, and which have not entirely lost their grammatical forms: we may even discover the laws which governed the transplantation of foreign elements of speech into a native soil. This is the foundation of the cultivated and poetic language of Java, and is closely connected with the introduction of literature and religion. All that has been said above undoubtedly has not operated with the language of the people, and still less can it be affirmed, that merely because Indian words are to be found in it they

were introduced in a similar manner. In thus tracing minutely the operations of the different modes of Indian influence, two deeply-seated questions arise, suggested by actual phenomena, but which are extremely difficult to answer accurately, viz. whether the whole of the civilization of the Archipelago is traceable to an Indian origin; and whether, from a period anterior to the rise of literature, and to the last and most complete development of the language, any connection existed between the Malay and Sanskrit languages, which is still capable of being traced in the social elements of speech?

"I am inclined to answer the former of these questions in the negative. It appears to me to be made out that the brown race had an original civilization of their own. It is still to be found in the Eastern portion, and is not altogether unrecognizable in Java. It may, indeed, be said, that the population of the Archipelago principally issued from its centre, where the influence of India was most powerful, and extended itself thence towards the east, so that the distinct Hindu element becomes more diluted at each extremity. This proposition, however, is supported, less by any distinct similarity than by remarkable coincidences in manners, which have nothing specially Indian to distinguish them, amongst the races of the central and eastern parts of the Archipelago. One sees also no reason why we should deny to a race like the Malay a self-developed civilization, in whatever subsequent direction the march of population, and their gradual culture may have been. A proof is even afforded by the readiness of the different tribes belonging to the race to adopt the Hinduism imported among them, and, still further, by the manner in which they still retain the indigenous element, and scarcely ever allow its peculiar form to merge in the Indian. The contrary would have happened if these races had been wild, uncultivated savages, when Indian colonization first came in contact with them. When I speak here of Hindus, I of course only mean people speaking the Sanskrit language, and not the inhabitants of the continent of India generally. How far the one race came in contact with, and was, perhaps, driven out by the other, I do not now enter upon, as my purpose is only to show the different elements of civilization by which the Malay races were influenced.

"The second question, which alone relates to language, must, I conceive, be answered in the affirmative. In this respect the limits of Hindu influence have a wider range. Without mentioning the Tagali, which contains a tolerable number of Sanskrit words, with completely different meanings, there are to be found, even in the languages of Madagascar and the South Sea Islands, both words and sounds belonging

to the Sanskrit, and in such an elementary part of speech as the pronoun; and even the modes of change of sound, which may be looked upon as a good comparative test of the period of introduction, are different in the languages of the narrower Malay zone, in which, as in the Javanese, it is notorious that the influences of Hindu literature and language displayed themselves at a much later period. It becomes, therefore, a matter of great difficulty to explain this phenomenon, and to ascertain what reciprocal operation these two great families of languages have on one another. At the end of this essay I will return to the subject, as it is sufficient for me here to call attention to the influence of Sanskrit on the Malay languages, which appears to be distinct from the subsequently introduced mental cultivation and literature, and to belong to a much earlier period, and to different connections between the two races. I shall subsequently touch on the languages of the Negro races, but must make the preliminary remark now, that if in some of these tongues, as in the Papuan of New Guinea for example, similarities with Sanskrit words are to be found, this does not at all prove any immediate connection between India and those islands, as such common words might have been introduced through the commerce of the Malays, just as we see now with Arabic terms.

"On seeking, therefore, to take a general view of the state of the civilization of the great Archipelago, we find the Malay populations to be hemmed in, as it were, between influences and characteristics which are strongly contrasted. On the same islands and island-groups, which still contain races on the lowest level of civilization, or where at all events such tribes once existed, we find a very ancient state of culture, which had borne choice fruits, and which, derived from India, had become indigenous. The Malay races have appropriated this culture, in nearly all its parts, to themselves. Herein they may be perceived to be connected in race with the inhabitants of the South Sea Islands, who, compared to them, may be looked on as savages; and it is even doubtful whether their language is altogether strange to the Negro races. The South Sea Islanders have kept themselves distinct from those rude races by institutions peculiar to themselves, and by a language which in its present form is quite their own. The population of the Great Archipelago, which, according to our present knowledge, cannot be traced to the continent of Asia, is found in places where all foreign influence must be left out of consideration, in a most rude and savage state, or on the lowest step of civilization. This is especially true if we regard only the Negro races and the South Sea Islanders, and exclude the Malay races, strictly so called, although no very

sufficient ground presents itself for ascribing to these races a much higher station in civilization before Indian influences had operated upon them. We still find, even with the Battas of Sumatra, whose myths and religion display unmistakeable traces of Hindu influence, the barbarous custom of cannibalism on certain occasions. The Great Archipelago, however, extends itself along the whole coast-line of Asia, and connects itself with both its extremities, stopped only by Africa on one side, and America on the other. Its centre lies at a considerable distance, so far as navigation is concerned, from the nearest point of the continent of Asia. At different times, therefore, it has been acted upon from the three great focuses of the earliest awakening of the human mind amongst mankind—China, India, and the seat of the Semitic races. It has felt the different influences of all of them at proportionately remote periods. To its earlier progress India alone contributed anything of importance; Arabia nothing, even if we except Madagascar; and China just as little of importance, notwithstanding its early settlements."

It will be seen by the above extract, that William von Humboldt arrived at the conclusion that the Malay language was the stem from which the various dialects spoken by the brown races inhabiting this vast portion of the globe had branched out. He also thought it an indisputable fact that all these brown races belonged to one family of nations, the Malay;* and in his explanation of the phenomenon of one race, and one universal language, being thus diffused over such a wide surface of the globe, and throughout such distantly severed localities, he appears to have supposed that a great convulsion of nature had occurred, by which a mighty continent had been shattered and overwhelmed, leaving only its mountain tops, with a few survivors clinging to them, to constitute the innumerable isles and islets of what has been so happily termed Polynesia. He also conceived that a clear connection existed between the Sanskrit and Malay languages, prior in time to the subsequent influence which Hinduism had impressed on the Malay language and on Malay civilization through the joint means of commerce and religion; and therefore that in all probability the Malayan tongue belonged to what has been latterly termed the Indo-European family of languages. He would also seem to be of opinion that when increasing knowledge made us more intimately acquainted with the languages of the black races, they also would be found to be closely connected with the Malay. His Editor, Buschmann, carrying out the views of his author still further, announces that he is

* Kawi Sprache, vol. ii. p. 216.

prepared to show in a forthcoming work, by analogous reasoning, that the various languages of America, which even Humboldt thought were distinct, are all closely allied tongues.

The profound philological qualifications which William von Humboldt brought to the investigation of these interesting phenomena are too well known to require remark; but they are well tested in the present inquiry by his demonstration of the true character of the mysterious Kawi language of Java, now obsolete in that island, but still the language of religion and law in the neighbouring island of Bali, where the Brahmanical faith has kept its footing. Sir Stamford Raffles, in his work on Java, considered it to be a foreign language, of unknown origin, imported into that island. Crawfurd, in his history of the Indian Archipelago, perceived its connection with Javanese, but deemed it to have been merely a written language of the priests. William von Humboldt proved, however, by a thorough scientific analysis, that the language is merely an archaic form of modern Javanese, though plentifully interspersed with Sanskrit terms; and subsequent inquiries have arrived at exactly the same conclusion, though by different premises.

Mr. Crawfurd, at an early period of his life, whilst in the Company's service, spent twelve years in places where the Malayan and Javanese languages are vernacular; the former portion of the time in the island of Java, under Sir S. Raffles, the latter at Singapore, of which he was the first Resident. At these places he obtained that insight into the vernacular tongues which active Indian administrators are so often seen to acquire, and from his work on the Archipelago, and the rich collections which he made on the spot, it will be observed that Baron William Humboldt derives the principal portion of the materials for the conclusions he draws in the work published after his death in 1838. Indeed, his illustrious brother, Baron Alexander Humboldt, in his preface to the posthumous work I have before mentioned, admits, that without the materials thus freely contributed by Mr. Crawfurd, the work in question could not have been produced; and the graceful terms in which the gratitude of the two most distinguished scholars of Europe is there expressed, must have been deemed an ample recompense for years of literary toil by him to whom they were addressed.

Mr. Crawfurd now comes before the world, as he tells us, with a work, which contains the result of labours, spread, though with various interruptions, over more than forty years; and I trust I am not misled by partiality for the author when I state my conviction that the mass of information, and originality of views, condensed in the thin octavo

volume which contains the preliminary dissertation, will awaken in no slight degree the attention of that distinguished school who are prosecuting the study of comparative philology in Continental Europe with an ardour little appreciated in India, and with results tending to throw the greatest light on the most interesting questions connected with the diffusion of the human race.

As the conclusions drawn by Mr. Crawfurd are diametrically opposed to those of William von Humboldt, it is well to recollect that the two authors come in conflict in different characters—the one a profound scholar, with all the information that the closet and devotion to the study of comparative philology can confer; the other a practical man, with accurate personal knowledge of the localities and of the races, and possessing, what the great Humboldt wanted, an intimate acquaintance with the chief vernacular languages on which the inquiry turns.

Mr. Crawfurd holds—1st. That there is no foundation for the prevalent idea that, Negroes excepted, all the descriptions of men in the limits I have above described belong to the same race—on the contrary, there are several races.

2nd. He also contends that many of the nations belonging to the same race, for example the Malays and Javanese, speak distinct languages.

3rd. He holds that the black race, the Austral-Negroes, or Negritoes, are not identical, and that their languages, like their races, are also distinct.

4th. He admits that the Polynesians speak one very largely diffused language, with dialectic differences, but maintains that it is quite distinct from the Malay.

In order to place the conflicting views of these two writers in closer opposition, it will be well to recapitulate the leading facts, and these are that in all the islands, from Madagascar to Easter Island,—a zone, I may recall to mind, embracing much more than half the circumference of the globe,—an infusion of the Malay language is to be found, with more or less of foreign adjuncts from Sanskrit and Arabic sources. Further, it is indisputable that in many of the insular languages considerable resemblances in grammatical construction and organic formation of sounds may be discovered. According to Humboldt, the Malay language (the purest form of which, he asserts, is now to be found in the Tagala, one of the languages of the Philippines,) is the mother language of this vast affiliation. But as in so widely a diffused family of languages there will be synonymes for very many of the leading ideas, one term being used by one nation, one by another, it may turn

out on comparison of different languages that not very many words are used by different groups in common. Humboldt, therefore, considers that the grammatical construction, and, above all, the accordance of grammatical sounds in two languages, is the most convincing proof of affinity. He lays down, accordingly, the following method, which he prescribes to himself:—

"I therefore shall not confine myself to a comparison of words, but especially address myself to the grammar. It will then appear that these races not only express their ideas in the same manner, but follow the same path in their forms of speech, form their words and construct their sentences with the same sounds, and according to the same laws, and therefore possess concrete grammatical forms, borrowed from one another. A language cannot be looked on as a mere aggregate of words. Every language is a system by which the mind embodies an idea in audible expression. It is the business of a philologist to discover the key to this system."

Mr. Crawfurd, on the other hand, objects to both of these tests, viz. the essential identity of a few words, and the supposed similarity of grammatical structure, the latter of which, when applied to languages of remarkably simple forms, such as those under discussion, affords but few salient points for comparison.

"With respect to the test by the identity of words," Mr. Crawfurd writes, "it has been imagined by some writers, that when the class of words expressing the first and simplest ideas of mankind are the same in two or more languages, such languages may be considered as derived from the same stock. This certainly does not accord with my experience of the Malayan and Polynesian languages, into which, from the simplicity of their structure, I find that well-sounding foreign words very readily gain admission. Instead of words expressing simple ideas being excluded, I should, on the whole, owing to the familiar and frequent use of the ideas, consider them the most amenable to adoption of any class of words whatsoever. Accordingly, such words will be found either to have supplanted native terms altogether, or to be used as familiar terms along with them. Thus, to give some examples in Malay: the most familiar words for the head, the shoulder, the face, a limb, a hair, a pile, brother, house, elephant, the sun, the day, to speak, to talk, are all Sanskrit.

"In Javanese we have from the same Sanskrit the head, the shoulders, the throat, the hand, the face, father, brother, son, daughter, woman, house, buffalo, elephant; with synonymes for the dog, and hog, the sun, the moon, the sea, and a mountain. In the language of

Bali, the name for the sun in most familiar use is Sanskrit, and a word of the same language is the only one in use for the numeral ten. It is on the same principle that I account for the existence of a similar class of Malayan words in the Tagala of the Philippines, although the whole number of Malayan words does not exceed one-fiftieth part of the language." (The Tagala, it will be recollected, is the language which William von Humboldt indicates as the purest form of Malay.) "In the Maori, or New Zealand, the words forehead, sky, gnat, stone, fruit, to drink, to die, are Malay or Javanese—yet of these two tongues there are not a hundred words in the whole language. As to the personal pronouns, which have often been referred to as evidence of a common tongue, in as far as concerns the language under examination, they are certainly the most interchangeable of words, and cannot possibly be received as evidence. Some of them, for example, are found in the Polynesian dialects, where, in a vocabulary of five thousand words, a hundred Malayan terms do not exist. The numerals must surely be considered as out of the catagory of early invented words, for they imply a very considerable social advancement, and seem to be just the class of words most likely to be adopted by any savages of tolerable natural capacity. The Australians are not savages of such capacity, and although with the opportunity of borrowing the Malayan numerals, they have not done so, and in their own languages count only as far as 'two.' "

Mr. Crawfurd then proceeds to submit his own test of a common language, and I subjoin it for the examination of the philologists belonging to our Society, whether in India or on the banks of the Tigris, who are engaged in kindred researches:—

"The words which appear to me most fit to test the unity of languages are those indispensable to their structure; which constitute, as it were, their framework, and without which they cannot be spoken or written. These are the prepositions, which represent the cases of language of complex structure, and the auxiliaries which represent times and moods. If a sentence can be constructed by words of the same origin in two or more languages, such languages may be safely considered as sister tongues—to be, in fact, dialects, or to have sprung from one stock. In applying this test, it is not necessary that the sentence so constructed should be grammatical, or that the parties speaking sister tongues should be intelligible to each other. The languages of the South of Europe can be written with words common to them all, derived from the Latin without the assistance of any of the foreign words which all of them contain. The common stock, therefore,

from which they are derived is Latin, and they are sister tongues. English can be written with great ease with words entirely Anglo-Saxon, and without any French words, although French forms a sixth part of the whole body of its words, but no sentence can be constructed consisting of French words only. The parent stock of our language therefore is not French, nor Latin, but Anglo-Saxon. By this test the Irish and Gaelic are shown to be, virtually, the same language, and the Welsh and Armorican to be sister dialects; but it will not prove that the Welsh and Irish, although they contain many words in common, are the same language, and derived from the same source.

"Applying this test to the Malayan languages, it will be found that a sentence of Malay can be constructed without the assistance of Javanese words, or of Javanese without the assistance of Malay words. Of course either of these two languages can be written or spoken without the least difficulty without a word of Sanskrit or Arabic. The Malay and Javanese, then, although a large proportion of their words be in common, are distinct languages, and as to their Sanskrit and Arabic elements, they are extrinsic and unessential. When the test is applied to the Polynesian languages we find an opposite result. A sentence in the Maori and Tahitian can be written in words common to both, and without the help of one word of the Malayan which they contain, just as a sentence of Welsh or Irish can be constructed without the help of Latin, although of this language they contain at least as large a proportion of words as the Maori or Tahitian do of Malayan. The Maori and Tahitian are therefore essentially the same language, and their Malayan ingredient is extrinsic."

According to Crawfurd's view, the Malayan races have diffused themselves, and the civilization which they attained by self-derived culture, from two distinct and independent centres. The Malayan-speaking Malays from the rich table-lands of the interior of Sumatra,—Sumatra, which, from its physical gifts, and large proportion of coast-line abutting on placid seas, would be at once seized on by the geographer as a focus of civilization; and the Javanese-speaking Malays from Java, an island not less richly endowed in physical advantages. The mode in which these races were enabled to come into contact with distant localities, such as Madagascar and the South Sea Islands, is minutely explained by reference to existing facts, and the evidence on this subject is not dissimilar to that collected by Sir Charles Lyell in support of his celebrated theory of geology.

The contact of the Malays with Hinduism is not less satisfactorily explained, and some curious facts connected with the commerce of the

East are brought to light. There is no doubt that a portion of the transit by which the much-prized products of the Spice Islands were conveyed to Rome was conducted by Hindus, and when the Europeans first came in contact with the races of the Archipelago in their own waters, they found an active commerce in existence between the Hindus of the Coromandel Coast and the Malays. Barbosa, a highly intelligent traveller, describing Malacca before its conquest by Albuquerque in 1511, says: "There are here many great merchants, Moors as well as Gentile strangers, but chiefly of the Chetis, who are of the Coromandel Coast, and have large ships, which they call giunchi" (junks). And again: "The merchants of the Coromandel Coast, called Chetis, who dwell among them, (the Malays,) are for the most part corpulent, and go naked from the waist upwards."* Mr. Crawfurd observes that "the word here given as Chetis there can be little doubt is a misprint for Kling, or Chleng,† which is the local name that would be given to the Hindu traders on the spot." But, with deference to so accurate an observer as Mr. Crawfurd, it would seem that Barbosa described the Hindu merchant by his own Tamil name; and his accurate description of the Coromandel Chitty, or Banyan, is a picture to the life, such as he may be seen at the present day, and with the same name, at Madras, or in the island of Ceylon.‡ Indeed, the similarity of the term Chitty, or Chetijs as Ramusio writes it, to the word used by the Maráthas in the Deccan, Shetti, to denote the trading classes, points out the common origin of the word in the Sanskrit word *S'restin*, a trader. I may further observe that a large body of evidence will be found collected in Ritter, and which Crawfurd seems to have overlooked, that tends to show Ceylon to have been the spot, at the commencement of the Christian era and subsequently, where the enterprising seafaring Hindus of Talinga, the Chinese with their heavily-laden junks, and the Arabs from the African Coast, assembled, in order to interchange the products of the East and West.§

* Ramusio, vol. i.—cited by Crawfurd.

† From Kalinga, which is the term applied by the Malays to denote India, being a corruption of Talinga, from whence the commercial Hindus issued to drive their trade in the Archipelago and elsewhere.

‡ So also Paolini distinguishes the traders of the Coromandel Coast by their native name from the Banyans of the Malabar Coast. Speaking of Cochin, he says: "Gli Ebrei i Baniani e li *Cettis* o Canarini vi hanno molti magazini." Cited by Marsden, Travels of Marco Polo, p. 679.

§ For example, Sopater, the friend of Cosmas, found many Chinese junks at Ceylon circa A. D. 560. So Ibn Batuta, A. D. 1340, found thirteen junks at Calicut, waiting for the monsoon to return to China. See Ritter's Asien, vol. iv. p. 592; vol. v. p. 28.

It would be tedious here to give the views of Mr. Crawfurd as to the mode in which two limitrophic nations, speaking distinct languages of simple structure, might be led to borrow a similar grammatical structure from one another; but the theory will inevitably remind the reader of the interesting essay of Adam Smith on the formation of language. Nor can I condense the substantial portion of the evidence on which the principal conclusions are founded. But with respect to the Tagala language, on which Humboldt has laid so much stress, as the purest form of the Malay, Crawfurd, after a minute analysis of its grammatical structure, denies wholly its alleged parentage, and gives the following result of a close examination of the 16,482 words in the Tagala Dictionary, published by Father Juan de Nouda:—

Malay and Javanese words	399
Sanskrit	33
Arabic	7
Persian	2
Telinga	1

This makes little more than one thirty-eighth part of the language.

I think that the sketch which I have given of the leading views of the two works under discussion may possibly show that the brilliant generalizations of Humboldt are scarcely reconcileable with the facts which the industry of subsequent writers has brought to light. Baron Humboldt, in a passage of noble eloquence in his *Essay on the South Sea Languages*, points out the causes which kept the nations of antiquity and of the middle ages in gloomy isolation. "But," he continues, "if there is any one idea which shines out conspicuously throughout all history in ever-increasing brilliancy,—if there is any idea which tends to prove the much-contested, and still more misunderstood, perfectibility of the human race,—it is the idea of HUMANITY. The endeavour to remove the boundaries which the prejudices and mutually conflicting selfish views of mankind have set up amongst one another, and to consider the whole of the human race, without reference to religion, nation, or colour, as one great family—an organic whole, bent on the attainment of a common end—the free development of its mental powers,—this is the grand and ultimate aim of society; and, at the same time, it contains within itself the true direction of man towards the indefinite development of his being. He looks upon the earth as it lies extended before him; the skies, so far as they are visible; the stars, with their eternal fires; and in his inner mind he considers them as his own, bestowed on him for contemplation and activity. Even as a child he sighs for heaven; to cross the seas; to

pass the limits of his narrow homestead; and then, again, like a plant, pines for his native soil,—just as all that is animating and beautiful in man, by directing his aspirations either to something longed for, or to something lost, prevents him from being bound up exclusively with the present."

Grand and animating views like these led the illustrious author to look upon general philology as one of the handmaids by which the nations of the earth might be brought into closer brotherhood, and he gave to the elaboration of the science the better part of his existence. If the generalizations thereby suggested have been too hasty, and if the additional body of facts which have been brought to light by Mr. Crawfurd and others* demonstrate that the time has not yet arrived for such large and world-comprehensive theories, this conclusion will only accord with the march of science in other departments of knowledge, and will point out, which is the end I desired principally to indicate in the present paper, that the field is still open for inquiry, and that a rich harvest still awaits the patient student and attentive observer amongst the countless tribes of the Indian and Pacific Oceans.

I may, perhaps, add, that I never arise from inquiries of this nature, which, from their union of fact and mystery are to many minds indescribably interesting, without being deeply impressed that the same great fact which the science of geology has indisputably established, viz. the recent appearance of man on the surface of the globe, is equally clearly proved by the study of ethnography, with the addition that the *recency* of the event becomes a chronological date, not one of geology.

* The reader is referred to a very interesting series of papers on the "Ethnology of the Indo-Pacific Islands," now in the course of publication in the *Journal of the Indian Archipelago*, by its able editor, Dr. Logan.

Art. IV.—*The Theory of the Great Elephanta Cave.* By the Reverend J. Stevenson, D.D.

Presented 13th May 1852.

The Caves of Elephanta have been so often described, and the last description of them, by Mr. Erskine, in the first volume of the Transactions of the Bombay Literary Society, is so excellent, that it may seem unnecessary to add anything to what has been already written with so much accuracy and detail. But the very excellence of Mr. Erskine's description, especially the minuteness with which he dwells on some particulars, has been one of the causes of my attempting to furnish a sketch, which, taking for granted what he has proved, and omitting what is of inferior moment, might better serve the purpose of the numerous visitors to Elephanta, who are not deeply versed in Hindu lore. At the same time, I am not without hopes of being able to exhibit to the general reader the theory of those interesting excavations, with a greater fulness and simplicity than has hitherto been done.

My literary readers will find in the notes appended some farther observations on the subject, and proofs which could not well be introduced into the narrative, and which will enable them better to judge of the accuracy of the theory of the caves, which, following Mr. Erskine in the general outlines, I have filled up, and illustrated from the Hindu sacred literature.

THE NAME ELEPHANTA.

The name Elephanta has been derived from a stone elephant, having, it would seem, originally a tiger on its shoulders, which stood near the southern landing-place. That figure, after successively losing its different members, crumbled down a few years ago into a mass of ruins, now scarcely distinguishable from the surrounding stones. The name Elephanta is still unknown to most of the uneducated natives, who call the island Gárapurí, (Gahrapooree,)* *i. e.* the Town of Excavations.

* The orthography of the text is the Jonesian; that within parentheses is intended to represent the sound better to the mere English reader.

The caves are called Lenen, (Laina,) a word used throughout India and Ceylon for these artificial grottoes, most probably on account of the first of them being intended for hermitages to Buddhist ascetics.

TIME OF CONSTRUCTION OF THE CAVES.

The time when these caves were excavated can only yet be guessed at, but it is supposed that it must have been some time between the eighth and twelfth centuries of the Christian era. The main reason for this supposition is, that from inscriptions and tablets found in various parts of Southern India, and architectural structures whose age is known, it seems that the religious system to which the carved images and architectural embellishments belong, had not gained much currency before the first mentioned of those eras; and, owing to their conflicts with the Mahomedans, the Hindu Rajas, it is surmised, would not be able to give attention to such works after the last mentioned period. The rock, also, out of which the caves are excavated, being full of rents, the water penetrates through it, and detaches piece after piece from the figures, so as to threaten to destroy them one day altogether. This process, then, it is conjectured, if the caves had been of very ancient date, would by this time have occasioned a greater degree of damage than we find has actually taken plaee. This damage, since the caves were first described by Niebuhr, has been very considerable, and several Europeans in Bombay can testify that even during the last quarter of a century it has been by no means immaterial.

THE LINGA CHAPEL.

The Great Cave at Elephanta is what the Hindus call a Síva Linga (Sheewa Ling) Temple, a class of sacred buildings very common in Southern and Central India. Many of the Brahmans in Bombay will not acknowledge its claim to this honor, and the place is now nearly deserted. They, with other natives, maintain that this and all the rest of the excavations around are the works of the sons of Pándu, who constructed them while wandering about the country in banishment from their native land. They imagine these excavations works far too mighty for the degenerate mortals of our day, a misconception which it is to be hoped the railway works, now in progress, will soon clear away. The reason why this temple has been deserted may have been the unhealthiness of the island, which, during certain seasons of the year, is very prolific of ague; or perhaps the first Europeans may have desecrated the images, and led the Hindus to abandon them. Although the current tradition that the Portuguese fired into the cave

from the offing, and hauled guns up the hill to its mouth to destroy the idols, is absurd, and could never, even if true, account for the actual damage done, as every visitor may easily satisfy himself; still it is not improbable that they desecrated the place, and that hence arose those popular stories. The Great Cave is nevertheless still visited by Hindus, especially of the Banyan caste, on the great festivals of Síva, and the great Ling is worshipped on these occasions by crowds of devotees.

After entering the Great Cave from the usual entrance on the north, the popular object of worship, which more particularly attracts the devotees above mentioned, is seen about half way up on the right hand, or towards the west of the cave. It is a conical stone called the Ling, and is enclosed in a square chapel with four doors, facing the four principal directions. The Ling is intended to represent Síva in his character of the prolific power of nature. Around this chapel on the outside are a number of large figures, representing door-keepers, who are supposed to be high caste Hindus. They lean on dwarfs, intended I suppose for low caste men, but called by the Hindus Pis'áches, (Peeshachas,) or demons. This, then, is the principal object of popular worship. All the other figures in this excavated temple are to be considered merely as subsidiary to this, and might rather be compared to our historical frescoes in Europe than to anything else. At most they can but be considered analogous to the pictures in churches in Southern Europe, additional to the altar-piece, which receive a degree of homage far inferior to that reserved for the patron saint.

THREE-FACED BUST, OR TRIMURTI.

The chief of the mural figures is the immense three-faced bust, nineteen feet in height, which faces the northern entrance. It is the representation of Síva (Sheewa) in his three-fold character of Brahmá, Vishnu, and Rudra, (Brumma, Vishnoo, and Roodra). The Hindu notion of the deity is, that God is essentially one, but that when the time for the renewal of the world arrives, he causes to emanate from his essence three impersonations of the divinity, one who creates, a second who preserves, and a third who destroys. The three-faced figure, then, called by the Hindus a Trimurti, (Treemoortee,) is intended to represent these three gods, who emanate from the one divinity, and still continue united in him. According to the system of Hinduism followed in these sculptures, the eternal divinity is Síva, in another system it is Vishnu, and in a third the principal goddess of the Hindus. Síva is sometimes represented with five faces, and it has

been surmised that this three-faced bust is intended to represent him in that form, one of the heads being hid behind, and another above. I have seen representations of this five-faced Síva, but in those figures part of all the five faces were visible, four arranged round the head, and one peeping out from the crown before the knot of twisted hair. In the other figures, especially that of Brahmá, as carved in these caves, a portion of all the faces any being is supposed to have are always represented. We do not, then, need to go to the Greek and Roman representations of the three-faced Hecate, as preserved in ancient sculptures, for an illustration of the theory for which we contend, when we find it universally adopted by Hindu artists, and even in these very caves. The bust, then, represents a three-faced god.

The central face—the one that immediately fronts the spectator in this triple bust—is intended for Síva in the character of Brahmá the Creator. Brahmá, again, I have little doubt, is the impersonation of the Brahman caste,—the originator of all the sacred rites and ceremonies of the Hindus. He is represented as an ascetic Brahman, with his characteristic gourd in one hand, to serve for a drinking vessel. The face to the spectator's right, and to the left of the bust, is Síva in the form of Vishnu the Preserver; he has here his unfailing mark, a full-blown lotus, in his right hand. To the right of the bust, again, or to the spectator's left, Síva appears as Rudra, *i. e.* the Destroyer, which is generally considered to be his proper character. He is smiling on a cobra capella, which is twisted round his arm, and with expanded hood looking him full in the face. A swelling on his forehead is his third eye, from which is to burst the flame that will consume at last the world. Among the ornaments of his cap are a death's skull, a leaf of the *nirgudi*, and a branch of the *bilva* tree, all peculiar characteristics of this god. The large figures at the portals are Hindu door-keepers, and they lean, as before, on dwarfs, called by the natives pis'áches, or demons, probably caricatures of the rude aborigines or hill tribes of the country. (See Note A.)

ARDHANARISHVAR, OR HALF MALE HALF FEMALE DIVINITY.

In the first compartment to the right of the central figure, or to the spectator's left, there is an exhibition of Síva (Sheewa) in his character of Ardhanáríshvar (Arddanahreeshwur). *The right half of the figure is intended to be that of a male, and the left that of a female, and thus to represent Síva as uniting the two sexes in his one person.* The first European visitors supposed this figure to be intended for an Amazon, transferring the traditions of Greece to India. No such being is known,

however, to Indian mythology, while such a manifestation of Síva as we have mentioned is described in the Puráns. The bull on which two of the hands of the figure lean, and on which it is supposed to ride, is called Nandi, (Nundee,) is a constant attendant on Síva. Brahmá, on his lotus throne, supported by five swans, and with his four faces, is exhibited on the right of the figure. He has a portion of all these faces visible. On the left, Vishnu is seen riding on what is now a headless Garuda, (Garoor,) a fabulous creature, half man half eagle. Above and in the back-ground are found a number of inferior gods, and sages of the Hindus, which neither our plan nor their importance will allow us to describe. We may mention, however, that Indra, king of the old gods,—those worshipped in ancient times,—appears there mounted on an elephant.

The porters will be found at the door of the compartment, as before. (See Note B.)

SIVA AND PARVATI.

The visitor must now retrace his steps, and, passing the large image, look to the first compartment on its left, or on the west side of the cave, and he will there see two principal figures, intended to represent Síva and Párvati, (Sheewa and Parwuttee,) the former to the right of the latter. From the head of the male figure the Ganges is represented as flowing, and from its centre three heads are seen to issue, representing Ganga, Yamuna, and Sarasvati, the deified rivers,—Ganges proper, Jumna, and Soorsatee of our maps,—which, when united, form the Ganges of the Lower Provinces, and which is fabled by the Hindus to spring from Síva's head. Síva is thus identified with the Himalaya Mountains, whence the Ganges really flows into Hindostan. (See Note C.)

ANALOGIES SUGGESTED BY THESE THREE COMPARTMENTS.

Unusual as it has become in recent times to trace any connection between the Hindu traditions and the Scripture records, I cannot allow myself to proceed without asking how it is possible for any unbiassed mind not to see in the triple figure an effort of the Hindu intellect grasping at that great doctrine, so diffused throughout the world, of an Unity and Trinity in the Deity. No one who studies the subject carefully will maintain that the Hindu and Christian notions on this subject are indentical; and no one who judges without prejudice can fail to see that there is an analogy between them, which is all that any sound theologian would ever think of maintaining. My own idea in respect to the derivation of this Hindu Triad is, that it had no wide-

spread currency in its present form till about the period above mentioned, —the eighth century of our era; that it was copied from the Buddhist Triad of Buddha, Dharma, and Sanga (Intellect, Virtue and Union); that this philosophical Trinity was derived from the ancient Vedic notion of the three sacrificial fires forming one Agni, or God of Fire—a much nearer approach to the Christian idea than the modern system; and that this, again, was connected with the Egyptian and other primeval traditions.

The half-male half-female figure I consider to be the Hindu way of representing the Adam whom God at first created, and from whose side a rib was separated for the formation of Eve. The third compartment under this notion will be an exhibition of Síva and Párvati as the progenitors of mankind, as they are declared to be in some of the Hindu mythological writings.

THE MARRIAGE OF SIVA AND PARVATI.

To the next compartment the visitor must proceed on in the same direction, still farther to the west, till he has passed the chapel first described, and he will see a group representing the marriage of Síva and Párvati; for, following up the analogy above noticed, the Hindu traditions represent Brahmá the Creator as performing the marriage ceremony, and uniting by a solemn rite the primeval male and female—thus giving a divine sanction to the institution of marriage. It is strange that, after the right idea had been suggested both by Pike and Moor, Mr. Erskine should have "perceived nothing to favour the supposition," since in this compartment alone does the female stand to the right of the male, a position a Hindu woman rarely occupies, except at her marriage. Like dining with her husband, it is one of the privileges of the wedding-day. Down in the corner, at the right of the female, is Brahmá, known by his four faces, sitting on his hams, and reading or reciting the sacred texts suited to the occasion. Among the attendants on the same side one is represented bearing a vessel, probably supposed to be filled with sugar-plums, and other sweetmeats, as is the custom still in Bombay, and exactly like one I accidentally saw in the streets while writing this paper. Vishnu will be noticed on his man-eagle conveyance on the other side, and in the back-ground a numerous train of inferior gods and goddesses. (See Note D.)

THE BIRTH OF SIVA'S FIRST SON.

The visitor must now retrace his steps a second time, and go to the corresponding compartment in the eastern side of the cave from where

he now is, near the place whence the rubbish was lately cleared away, and the two lions brought to light. There he will again see Síva and Párvati in the fore-ground, and a little behind them, but somewhat nearer to the latter than to the former, he will observe a female with a child, borne astraddle upon her haunch, in the way little children are usually carried in India. The child is Vináyaka, or Ganesha, usually in Bombay called Ganpati, (Gunputtee,) and is Síva's eldest son. The legends about his birth and infancy greatly vary, and it must suffice us here to say, that although at first possessed of a proper human form, as here represented, he had soon the misfortune to lose his head, and, no better substitute being forthcoming, an elephant's was clapped upon his shoulders, which to this day he has been doomed to wear, and with which he is always represented in the compartments yet to be described. Among the group of figures Bhringi, a special favourite and worshipper of Síva, reduced almost to a skeleton, is conspicuous, as also Párvati's tiger, on which she rides when she goes abroad. (See Note E.)

RAVANA UNDER KAILAS.

The visitor must now turn round his face in the opposite direction, and instead of looking southward, look northward, and, after advancing a few paces, he will come directly in front of the sixth compartment. There is here exhibited a group representing Rávana, (Rahwun,) king of Lanka or Ceylon, as well as of all India south of the Nerbudda, under Kailás, the heavenly hill of Síva, while Síva and his attendants are sitting above. Rávana, it will be observed, has ten heads, and, as the legend goes, he had got under the hill for the purpose of carrying it off to Ceylon, and thus keeping Síva all to himself, and protecting himself against Ráma, by whom he was at last slain. Párvati, having in alarm cried out that the hill was shaking, Síva raises up his leg as here represented, and firmly fixes down Rávana between heaven and earth, where he remains ten thousand years, till, taught by his grandfather to propitiate the god, he is at last released; and after which he continues, notwithstanding all his crimes, a devoted worshipper of Síva. Rávana I suppose to be the type of the rude aborigines who inhabited India before the Brahmans and high caste Hindus from the north invaded the country. The moral taught in this compartment, then, is Síva's power over these rude aborigines, and their devotion to his worship.

DAKSHA'S SACRIFICE DESTROYED.

To follow out the theory of the cave systematically, it is necessary for the visitor once more to cross to the opposite side, and, passing the

Linga Chapel, place himself before the corresponding compartment on the west. The legend referred to in this sculpture is one very famous in Hindu mythology. It is represented at Ellora twice, and once or twice in the caves near Ambolí, in Salsette. Daksha, (Duksh,) the patriarch of the high caste Hindus, had begun to perform a sacrifice, according to the ancient Vedic ritual, and to which all the gods that should be worshipped according to the Vedas were invited. Síva and his wife did not belong to that number, and of course were not asked to attend. At this the lady took sore offence, and excited her husband to assume the form of Víra Bhadra, (Veer Buddra,) here occupying the principal place in the tableaux, for the purpose of spoiling the sacrifice, and dispersing the attendants. One of the hands of the god has seized Daksha's coronal tuft of hair, another is holding a vessel to catch his blood, and a third is wielding an immense sword, with which he is about to cut off his head. The head was hacked to pieces and burnt, and when Síva's wrath was afterwards appeased, the goat or ram's head that had been sacrificed was made to supply its place, thus keeping him ever mindful of the might of Síva, and of the offence he had committed against it.

The rest of the gods, among whom Indra, sitting on his elephant, is conspicuous, seem petrified with terror, but whether the word went forth *sauve qui peut*, or whether they stood forward and manfully fought it out, cannot from the variation in our authorities be determined. All agree, however, that in the end they were reconciled to Síva, and worshipped him as the supreme god. There is a remarkable bottle-shaped figure above the principal image, around which the sages are seated in adoration. This is a Ling, the emblem of the worship of Síva, at this time fully established. It has on it a circular figure, which may perhaps be regarded as the mystic *Om*, the emblem of the Triad, and compounded, as the Brahmans tell us, of *A*, *U*, and *M*, the emblems of the three great gods respectively, and which the French would pronounce exactly as the Hindus do, for *Om* is pronounced like the French *Aûme*.

The legend referred to in this tableaux scarcely conceals that there was at the time mentioned a contest between the followers of the ancient Brahmanical ritual and the adherents of the new system, in which Síva, a god borrowed from the superstition of the aboriginal Hindus, the worship of the Ling, and other heterogeneous elements, were introduced,—a system essentially the same as the current Saiva Hinduism. This group, then, marks the putting down of the Vedic Brahmanism, and the substitution of Saivaism, and the worship of the Ling, in its room.

BHAIRAVA.

The visitor, proceeding outward towards the entrance of the cave, arrives at another compartment, still on the same side. Síva is here represented in his character of Bhairava, a form he took to put down the extravagant pretensions of the sectaries of Vishnu. In Southern India the Narsinha, (Nursing,) or man-lion, of the same form nearly as the Egyptian Sphynx, is one of the forms under which Vishnu is worshipped. Bhairava was created to put down the boasting of this incarnation of Vishnu, who maintained that he was superior to Síva. Ganpati and other attendants are here sculptured, but there is no appearance of actual warfare. This is, perhaps, intentional. The artist thought it sufficient to exhibit the god in this form to assert his supremacy, without irritating the numerous worshippers of Vishnu as the supreme deity, by any humiliating mark of inferiority. Such caution was not necessary in the last described compartment, as all natives on this side of India, and I believe everywhere else, maintain the supremacy of either Vishnu or Síva.

SIVA AS A RELIGIOUS ASCETIC.

Turning round, and advancing a little, the visitor comes in front of the last group, in which Síva is exhibited as a religious ascetic. Asceticism is the highest form of all the different systems of Hinduism. None of them promise union with deity to any, as a general rule, except to ascetics. As such a one Síva is here represented,—as a Yogí, which is the name the Brahmans give to a Saiva ascetic of the highest order. The Gosains, who go about our streets covered with ashes, belong to an inferior sect. This is the figure supposed to represent Buddha by the earlier visitors, an explanation of it against which Mr. Erskine has given very good reasons. Nevertheless, it is not improbable that the Saiva asceticism, with its monastic establishments, and the yellow garments of those that are clothed, has been borrowed from Buddhism. Though this figure, then, were an image of Buddha, it would be Síva as Buddha, Síva the sage, the possessor of every attribute that can inspire reverential awe. Among the ten avatárs of Vishnu there is one called the Bauddha, evidently a caricature of Buddhism, and there is no reason why Buddha might not have been made an avatár of Síva the Mahayogí.

SUPPLEMENTARY EXCAVATIONS.

There is a small excavation in the face of the hill to the west, just opposite to the Ling Chapel first described, dedicated to Ganesha,

(Gunputtee). He himself, easily recognized by his elephant head and pot-belly, is seated at the southern extremity, and the company, of which he is the leader, is ranged along the western wall of the small excavation. On going out by the eastern opening, the visitor finds a stair with a few steps, on each side of which is a sculptured lion, leading to a small Ling Chapel, on which are no figures. On going round the hill a little way to the south, two other excavations close to one another are found, fronting the east. They too are Ling Chapels, with a few sculptures outside, representing door-keepers, &c. such as before described. On the hill opposite to that out of which the Great Cave has been excavated, an excavation has been commenced, but the work seems to have been stopped before any material progress had been made.

CONCLUSION.

The Great Elephanta Cave, then, contains a representation of the chief objects of Saiva worship, and of some of the great events that took place on the establishment of that form of Hinduism. The five tableaux on the southern wall, as we have shown, point to traditions that are in a great measure common to all the ancient nations that attained to any degree of civilization; and the following three mark so many great struggles that took place in the establishment of the present system of Saiva Hinduism; while the last points to the quiet that succeeded these conflicts, by the supremacy of the system which is fitly enough exhibited by representing Síva in the peaceful character of a religious ascetic.

NOTES.

A.

The idea of the principal figure in the Elephanta Caves being Síva, in the character of Brahmá, Vishnu, and Rudra, is mentioned by Mr. Erskine as having been suggested to him by a learned friend. Who the learned antiquarian referred to was I do not know; but though this theory was set aside by Mr. Erskine, from erroneously supposing it inconsistent with the unity of design manifested in the sculptures of the cave, it is doubtless the true one, as the following considerations will show.

In looking about for illustrations of the Elephanta Caves in the existing body of Hindu sacred literature, I found that the legends sculptured are all, with a single unimportant exception, to be met with in the Linga Purána, and follow it, even when they are differently narrated, in others of those compilations of Hindu traditions. This Purána

advocates the Smartta theory, which Colonel Kennedy has explained to differ from the Saiva in this—that whereas the latter allows of no worship to be paid to Vishnu, the former, while maintaining the supremacy of Síva above all the other gods, yet directs them also to be worshipped in subordination to him; just as the Bhágavata ascribes supremacy to Vishnu, while admitting other gods to a share in divine honours, and thus differs from the exclusive Vaishnava theory. In reference to the three-faced bust of Elephanta, the very first line in the Linga Purána illustrates it. It is नमो रुद्राय हरये ब्रह्मणे परमात्मने. "Adored be Rudra, Hari, and Bramhá, the Supreme Spirit." After finishing the table of contents, we have, in the commencement of 11th Adhyáya, a brief account of the manifestation of Síva as Purusha and Prakriti (the former and thing formed); and then of the Linga as one, seven, eight, and eleven; and in the 6th Shloka we have the following important statement:—

तेभ्यः प्रधान देवानां त्रयमासी छिवात्मकं॥
एकस्मात्त्रिष्वभू द्विश्व मेकेन परिरक्षितं॥
एकेनैव हृतंविश्वं व्याप्तं त्वेकं शिवेनतु॥

"After these the chief of all the gods, the Triad manifestation of Síva, was produced. The world sprung from one of these three, by another it is preserved, and by a third it is destroyed, and the whole world is pervaded by this one Síva." Nothing can be plainer than this. Besides, it is to be borne in mind that among the Maráthas of the present day there is an object of adoration called Dattátreya, affirmed by all of multitudes of learned and unlearned Hindus I have asked, and these are not a few, to be an incarnation of the three gods, Brahmá, Vishnu, and Síva. In ordering while at Poona from a native artist a set of all the objects of divine worship in the place, without any particular directions given, he brought me one of this god with three faces, and one full length figure. I showed also the picture of the Elephanta bust, given in the first volume of the Literary Transactions, the other day, to a Poona Brahman, who had never seen the caves, nor heard the sentiments of Europeans on the subject of them, and he said, after looking at it, that it was a figure of Síva. I then replied, Síva in what form,—has Síva not got five faces? He seemed then a little taken aback, and, after examining the figure more minutely, he said it probably was Síva as an incarnation of the three principal gods, Brahmá, Vishnu, and Rudra. The sentiments, then, of the natives on this side of India, are quite in unison with the idea I have expressed, whatever may be those entertained by the natives of Bengal and Upper

India. What is especially to be noted in this theory is, that Síva is, properly speaking, the eternal deity,—or, as he is termed in our Purána, the Paramátmá,—and that the three by whom the operations of the world are carried on are Brahmá, Vishnu, and Rudra—Rudra being distinguished from Síva. Colonel Sykes, after examining carefully the Trimurtis in the hill at Ellora, concludes that one member of the Triad is a female. I do not think this can be the case with the Elephanta Triad, but I see no necessity for those at Ellora being busts of the same form of the divinity. The Ellora busts may represent Síva, Párvati, and Vishnu, although in reference to this I speak only hypothetically, not having found anything in the Puránas or popular traditions to support such a theory. In appearance, they certainly differ considerably from the figures at Elephanta. The union of which Párvati is a member is usually indeed a double one, such as is described in the next compartment,—still such a union could subsist, theoretically at least, without running in anything counter to the Smartta system of Hinduism.

B.

The Ardhanárishvar is well known to the students of Hindu antiquities, and no illustration of it is needed; yet the following passage from the Linga Purána on the subject may be interesting—it is from the 5th Adhyáya of the first part:—

पुत्रीकृता सती या सा मानसी शिवसंभवा ॥
दक्षेण जगतां धात्री रुद्रमेवा स्थिता पतिं ॥
अर्द्धनारीश्वरं दृष्ट्वा सर्गादौ कनकांडजः ॥
विभक्तेतीत्यादौ यदाजाता शुभा ॥
तस्याश्चैवां शजाः सर्वास्त्रिया स्त्रिभुवने तथा ॥
एकादशविध रुद्रास्तस्यां शैरुद्भवा स्तथा ॥
स्त्रिलिंगमाखिलं सावै पुंस्त्रिंग नील लोहितः ॥

"Daksha, having produced his mental daughter Satí, adapted for Síva, applied her to the Lord Rudra. At the beginning of the multiplication of creatures, (Brahmá,) sprung from the golden egg, said to this (Ardhanárishvar) half-male half-female divinity—'Divide thyself': then she sprang forth a fair female, and as portions of her all the females in the three worlds have been produced in succession; and from the male sprang as portions of him the eleven Rudras, and so on. She was entirely a female, and he entirely a male."

C.

The last portion of the above quotation illustrates the subject of the third compartment,—the separated Síva and Párvati.

D.

The legend of the marriage of Síva is given in the 98th Adhyáya of the Linga Purána. That Brahmá Deva was the officiating priest the following words distinctly show :—

ततः प्रनम्य हृष्टात्मा ब्रह्मलोक पिता महः ॥
हस्त देवस्य देव्याश्च चयोज परमप्रभुः ॥

"Then bowing reverentially, and rejoicing in spirit, the great father of Brahmáloka, the supreme lord, joined the hands of the god and goddess." During some religious rites, as well as at marriages, the wife appears on the husband's right, yet there can be no reasonable doubt that this is the marriage I have mentioned.

E.

The next Adhyáya, the 99th, contains the account of the production of Vináyaka, or Ganesha, and this is the main reason that I have fixed on him, rather than on Kártikeya, as the child here represented. He afterwards also acts a more important part, and much more is said about him than about his brother, who is not mentioned till afterwards. The story generally current among the Hindus here, that Ganesha was formed of the scurf of Párvati's skin, is not adopted in this Purána; he is brought forth at once by the power of Síva, or rather is a manifestation of Síva, as the following line shows :—

ततस्तदा निशम्यवै पिनाकधृक् सुरेश्वरो : गणेश्वरं सुरेश्वरं वपुर्दधारस :

F.

The legend of Rávana's attempting to carry off Kailás is the only one illustrative of the Elephanta sculptures that I have not met with in the Linga Purána. It is so generally known, however, and the subject so unquestionably refers to this mythological history, that the want is of no consequence.

G.

The legend of Daksha, taken from the Váya Purána, is translated by Professor Wilson in his Vishnu Purána. The Linga is still more severe upon the gods. There is, according to it, a regular stand-up fight, and not even Vishnu escapes with his life. At the intercession of Brahmá, however, who was not in the fray, and comes in at the end as a mediator, Síva restores them to life, when they all become his reverential worshippers. The account of this transaction is in the 95th Adhyáya. This legend brings also before us the important fact that

Brahmá was not a Vedic god, though, as the deified Prajapati, or Brahman patriarch in after times, he is artfully supposed here to come in and intercede for the other gods.

II.

Before meeting with the account of the production of Bhairava, contained in the 91st Adhyáya of the Linga, I never understood rightly the relation in which Víra Bhadra and Bhairava stood to one another, or what were their peculiar offices. It appears, then, that the former was a special manifestation of Síva, for the purpose of humbling the followers of the ancient Vedic worship; and the latter to bring down the pride of the modern Vaishnavas, and their avatárs of Vishnu. As I have not seen this idea referred to by Europeans, I give a portion of the account as it stands in the original. The conflict is said to have been maintained with Narsinha, who, after his victory over Hiranyakasípu, became quite overbearing, and insufferable in his insolence to gods and men. The divinities, accordingly, with Brahmá at their head, supplicated aid of Síva. The narrative then proceeds as follows:—

एवमभ्यर्थितो देवैर्भैरवं चक्रे कृपालयः ॥
यत्तेजसा नृसिंहारव्यं संहर्तुं परमेश्वरः ॥
तदर्थं स्मृतवान् रुद्रो वीरभद्रं महाबलं ॥
आत्मनो भैरवं रूपं महाप्रलयकारकं ॥
आजगाम पुरासद्यो गणानाम ग्रतो हसन् ॥
सदृग्हासैर्गणवरै रत्य तद्भि रितस्ततः ॥

"Being thus entreated by the gods, he mercifully formed his plan; and the supreme lord Rudra, that he might encircle himself with the radiance necessary to slay him who is called the man-lion, meditated upon the mighty Víra Bhadra, and caused to proceed from himself the form of Bhairava, which will one day destroy the world. Smiling, he sprang now, as formerly, to the front of the band of clotted-haired grinning heroes, that were produced along with him."

We have, then, two or three speeches of defiance in the Homeric style, when Bhairava assumes the form of the bird Sarabha, and over and over again lifts the helpless Narsinha up in the air, and dashes him down on a rock, till he cries peccavi, and नमो रुद्राय.

I.

In illustration of the compartment where Síva is represented as a Mahayogí, the whole of the 22nd Adhyáya of this Purán is important. It is a section, which describes prophetically the spiritual worship of

Síva, and the ascetic forms he assumes in all the twenty-eight Manwantaras, when seated amid his four sons, forming a group like the five Dhyáni Buddhas, he spends his time in mental contemplation. Síva, it is said, will in the ninth Manwantara be called Rishaba;—now Rishaba was a Hindu ascetic king, whom the Jains claim as their first Tirthankara. In the tenth, it is said, he will be a Muni, seated on the top of the Himalayas. In the fourteenth, it is said, he will be called Gautama, and sit in the Gautama Vana. Gautama is both the name of a Hindu sage, and of the last Buddha, but the attitude and place lead us to think of the latter rather than of the former, though the author probably wished his readers to understand the Brahman Gautama. In the eighteenth, he will be called Sikhandi, *i. e.* "feather-crested," whence a sect of Gosains derive their peculiar badge. In the twelfth, he is to be called Atri, and cover himself with ashes, as a large sect of Gosains do. In the seventeenth, he is to be called Guhavâsi, *i. e.* "inhabitant of the cave," and to sit in a cave of the Himalaya Mountains. It might be hazardous to affirm that the sculptor had this last form of Síva especially in his mind. I am rather inclined to believe that he intended to give a general figure, which might stand for Síva in any of the ascetic forms he had assumed in different eras; but that the intention was to represent Síva as a Yogí I think cannot admit of even the shadow of a doubt. It agrees with the general conception that runs throughout the whole, and I cannot conceive how any one can seek an explanation different from that which the chapter of the Purána referred to suggests.

ART. V.—*Brief Memorial of the Literary Researches of the late* WILLIAM ERSKINE, *Esq.* By JOHN WILSON, D.D., F.R.S., Honorary President of the Bombay Branch Royal Asiatic Society.

Presented, July 15, 1852.

MR. ERSKINE came to Bombay with Sir James Mackintosh in 1804. "I had the good fortune," says that acute judge and exquisite critic of human character and culture, "to bring out with me a young Scotch gentleman, Mr. Erskine, who is one of the most amiable, ingenious, and accurately informed men in the world." "My philosophical friend Erskine," was the designation which he not unfrequently gave him in his conversation and correspondence. In 1809, this admired friend of Sir James became his respected son-in-law.

In 1808, Mr. Erskine was appointed Clerk to the Court of Small Causes, a division of the Recorder's Court over which Sir James Mackintosh presided. For many years he was one of the Magistrates of the island. In 1820, he was nominated Master in Equity by Sir W. D. Evans. During the nineteen years he was in Bombay, he enjoyed the highest character for ability, learning, integrity, and honour. When, in consequence of the failure of his health, and his removal from his offices in the Court, he left India in 1823, he was thus addressed by between sixty and seventy gentlemen, forming the body of the European Society of Bombay :—"Few of us have had the happiness of your acquaintance during the whole period of nineteen years that you have resided here. But early intimacy, or the report of our predecessors, impressed all of us with such an estimation of your character, as inspired our respect and esteem; and which subsequent intercourse has to the last moment increased and confirmed. In public life we have observed you perform the arduous duties of various important situations with the most conciliating address, the greatest ability, the strictest integrity, and the most benevolent but impartial justice. In private life, we have been delighted with the most engaging urbanity, the correctest feelings of a gentleman, the nicest principles of honour, and the loftiest sentiments

of disinterestedness. In literary pursuits, your animating example diffused a love of literature, and your intimate acquaintance with the learning of the West and the East enabled you to communicate that information which might have been elsewhere sought in vain, and to confer, not only on many of us, but on others, the important benefit of your advice in the direction and amelioration of our pursuits and studies." Mr. Erskine took a large share in the management of some of the philanthropic institutions of Bombay. Some of the early reports of our Bible Society are from his pen. It is due to him to say, that he was the first advocate of such charity schools as those of the Bombay Education Society now in Byculla, as is evident from his correspondence in one of the documents now referred to.

But it is principally in connexion with this Society that at present we have to do with Mr. Erskine. He was one of its most distinguished founders. He was present at the meeting of seventeen gentlemen held in Government House, Parell, on the 26th November 1804, when, on the proposal of Sir James Mackintosh, it was constituted under its original designation of THE LITERARY SOCIETY OF BOMBAY; and he was then appointed to the office of Secretary, on the efficient discharge of the duties of which the prosperity and advancement of the institution was greatly dependent. He was the last survivor of the twenty-eight members who were enrolled at its first meeting. He held the office of Vice-President for some years before he left India. On that occasion, a letter of thanks was, on the motion of the then President, the Honorable Mountstuart Elphinstone, seconded by Archdeacon Barnes, addressed to him, which, as it has not yet appeared in any of the publications of the Society, or its English consociate, the Royal Asiatic Society of Great Britain and Ireland, may be here introduced:—

"SIR,—Your unexpected return to your native country has prevented the Literary Society of Bombay from expressing to you, previous to your departure, the high sense that it entertains of the important benefits which you have conferred on it. One of the original members by whom it was instituted in 1804, you became the Secretary; and it is to your unremitting and judicious exertions in that situation to which the formation and prosperity of the Society must be principally attributed. The kindness, also, with which you have assisted in preparing its Transactions for the press, and in contributing to them papers so distinguished by their learning, research, and elegance of style, have given to that work an interest and a value which it would not otherwise have possessed. But not in these respects alone has your influence

proved beneficial to literature; for your intimate acquaintance with classical, modern, and Oriental literature, your sound judgment, and your correct and cultivated taste, have enabled you to afford to others that information which is so often requisite in this country, and to point out to them the studies and pursuits to which their attention might be most advantageously directed. The readiness, at the same time, and indulgence with which such assistance has always been given, can be only equalled by the unassuming manner and the urbanity with which opinions the most instructive were invariably communicated.

"That the loss of a person possessed of such eminent qualifications and abilities can ever be replaced is scarcely to be expected. But the regret which the Society experiences on this occasion is diminished by the hope that the interests of literature will be materially promoted by your now being relieved from the interruptions of official business. That your constitution may re-invigorate by your return to your native country, and that you may enjoy undisturbed happiness for many years in the bosom of your family, and in the solace of literary pursuits, are the sincere wishes of a Society by whom you will ever be remembered with sentiments of the truest respect and esteem."

This letter was from the pen of Captain (afterwards Major-General) Vans Kennedy, who well weighed his words in complimentary addresses.

The first paper laid before the Society by Mr. Erskine was entitled—"Observations on two Sepulchral Urns found at Bushire, in Persia." It was read on the 6th July 1813. The antiquities of which it treats had been forwarded to him in Bombay by Mr. Bruce, the Resident in the Persian Gulf. They were of the cylindrical form, of which many examples have since been found both in Persia and its confines. Mr. Erskine, after showing by quotations from Herodotus, Strabo, and Sextus Empiricus, that the ancient Persians did not universally follow the mode of sepulture in *dakhmas*, or "towers of silence," as they have been of late denominated, now in use among the Zoroastrians, came to the following conclusion:—"It seems not improbable that the urns found at Bushire contain the remains of two ancient Persian fire-worshippers; the bones were probably those of poor people, who used an urn of baked clay, as a cheap and effectual method of excluding the elements; and the bones were not probably deposited in them till they had been blanched and purified by the exposure of the corpse to the air, and to birds and beasts of prey." Questions relative to the disposal of the dead in olden times have their principal interest, and that is frequently of no unimportant a character, in the light which they throw on the ancient ethnography and religions of the world.

Mr. Erskine's second paper, laid before the Society also in 1813, was that for which he is best known to the public in India—the "Account of the Cave-Temple of Elephanta." It is one of a remarkably interesting character. It is correct and minute, without being tedious; and its individual descriptions are associated with general and important deductions, illustrative of the Hindu religion and mythology, the state of the arts at the time the temple was excavated, and the manners and customs of the inhabitants of India. It bears ample evidence to the accuracy and refinement of the author's taste and judgment, and to the caution of his research as an Oriental antiquarian. Like Niebuhr, and some other writers who had preceded him, he associated the excavations solely with the *Shaiva* form of the Hindu religion. No corrections of any consequence have been made of his general or specific interpretations of their varied arrangements and multitudinous figures, though the theory which he mentions as that of one of his friends, that "the temple might be dedicated to *Shiva* [as in the case of the *Trimúrti*] with the attributes of *Brahmá* and *Vishnu* [superadded]," is that which will now be assented to by all competent judges. All doubt on this subject was set at rest by Professor H. H. Wilson, in the *Quarterly Oriental Magazine* for 1824. Such of the Hindu *Puránas*, indeed, as are devoted to *Shiva*,—the *Matsya, Kaurma, Lainga, Shaiva, Skanda,* and *Agneya*, —all absorb the attributes of *Brahmá* and *Vishnu* in their favourite deity; while in the spirit of the violent sectarianism by which modern Hinduism is characterized, those devoted to *Vishnu*, and partially those devoted to *Brahmá*, make a similar usurpation for the objects of their admiration. In *Shiva* himself, independently of this circumstance, several distinct gods have been combined by the Bráhmans, in deference to him as the "Great God," *Mahádeva*, a popular divinity, originally unknown to their pantheon, as well shown by Professor Lassen in his invaluable work on Indian archæology. His worship under the form of the *Linga*, or *Phallus*, as hinted at by Mr. Erskine, originated in the south of India. It is rather remarkable that Mr. Erskine's estimate of the age of the Elephanta temple, though founded on more restricted data than those now possessed, is likely to prove nearly correct.

Mr. Erskine's third paper, "On the Sacred Books and Religion of the Pársís," was laid before the Society in 1819. He takes a rapid view in it of what was then known of the ancient languages of Persia; examines the comparative value and authenticity of the details of ancient Persian history, as contained in the writers of Greece and Rome on the one hand, and of Persia on the other; gives a short sketch of

the tenets of the modern Pársís, and the works ascribed to Zoroaster, on which they are founded; and briefly indicates the proofs of the antiquity of many of their particular doctrines and observances. The contribution is an admirable one; and it must be admitted to be extremely creditable to the research and observation of the author, especially when the restricted nature of our, now excellent, Bombay library at the time when it was composed is taken into consideration. It forms an important document in the history of the investigation of the literature and religion of the ancient Ariana. According to the views which it advocates, the Zend language is of Indian origin, and the Persian liturgy of no higher antiquity than the age of the Sasánís. But these views the philological labours of Bopp, Burnouf, Lassen, and others, ultimately led him to change. In a letter, addressed to the writer of this imperfect memorial, dated the 14th November 1843, he expresses his strong approbation of the general views both of the Zend language and religion which are contained in his larger work on "The Pársí Religion," remarking of the most important matters on which we had differed, "you are no doubt right." However, one of his most important theses on the Zend language, that it is not the *parent* of the present Persian, can easily now be established. The inscriptions of the Achæmenian Kings at Besitun, so ably deciphered and interpreted by Colonel Rawlinson, and Professor Westergaard, reveal to us the true parent of the Persian, which is not Zend, though a cognate tongue. The Zend, as will soon be publicly shown by Westergaard, was in its two dialects the language of Soghdia and Bactria. The greater portion of its literary fragments transcend the times of the Achæmenides, and are devoted to a rude and peculiar state of society, bordering perhaps on the reign of Dejoces. Whether Zoroaster was a historical, or merely a mythological personage, is not yet certainly known. Mr. Erskine well shows the discrepancies which are to be found respecting him in the Greek writers, as well as severely comments on the incongruities which have found currency under his name.

Mr. Erskine's fourth communication to the Society forms an accompaniment to the preceding. It is directed to the disproof of the authenticity and genuineness of two works of high pretension—the *Desátir* and *Dabistán*, brought into notice by some ingenious but unfounded conjectures of the prince and pioneer of British Orientalists in India, Sir William Jones; and it is most thoroughly successful in its adducement of facts and arguments. It displays critical acumen of a high order. It thus concludes:—"From what I have already said,

you will be sufficiently aware what my opinion is regarding both the *Desátir* and the *Dabistán*: you will see that I am not sanguine enough to hope that any gleam of light can be cast from any such quarters over the early history of mankind. You will have discovered that, far from regarding the doctrines of the *Desátir*, and the historical narrative of the *Dabistán*, as resting on *unexceptionable authority*, and as consequently believing that the learning and philosophy of Persia existed some thousand years ago, and produced the science of the Greeks and the Bráhmans; I consider the whole of the peculiar doctrines ascribed to Mahábád and Hoshang as being borrowed from the mystical doctrines of the Persian Sufis, and from the ascetic tenets and practices of the Yogis and Sányáshis of India, who drew many of their opinions from the Vedánti school. I regard them as having had no existence before the time of Azer-Keiwán and his disciples, in the reigns of Akbár and Jehángír, and as having been devised and reduced into form between 200 and 300 years ago, in the school of the Sipásí philosophers. The language of the *Desátir* I regard as one fabricated, with no great address, to support this religious or philosophical imposture, and as at no time having belonged to any tribe or nation on the face of the earth." Since these remarks were penned, no more has been heard of the *Desátir*, except as a cunningly devised, though clumsily executed, literary forgery. The *Dabistán*, as illustrative of the professions and speculations of its dreamy authors, has yet some relative interest.

Mr. Erskine's last communication to the Society is entitled "Observations on the Remains of the Buddhists in India." It treats of the comparative antiquity of the Buddhists, Jainas, and Bráhmans,—justly giving the palm to the latter, from whom the Buddhists are dissenters, while the Jainas are dissenters from the Buddhists; of the tests by which their respective religious excavations may be distinguished; and of the actual remains of the Buddhists in India, as far as they were known in 1821. There is much condensation in it of information elsewhere scattered over an extended surface. It conveyed to the reader, too, much novel intelligence at the time it appeared. Like all that proceeded from the pen of the author, it is both sound and substantial.

In 1826, Mr. Erskine published the autobiography of the Emperor Baber, translated by the late learned Dr. John Leyden and himself from the Jaghatai Turkí, so little known to Europeans, though one of the most powerful and refined languages, as far as natural description is concerned, which is spoken in Asia. Of the most valuable and ably written historical and geographical introduction to this most curious and important work, as well of the numerous illustrative notes and

supplements which are attached to it, he was the sole author. It cost him an immensity of labour in Bombay, where it was prepared, and great editorial care, when he carried it through the press in Edinburgh. It is one of the most precious literary contributions which the East has given to the West in modern times. Baber united in his extraordinary character the general, the statesman, the poet, and the scholar, though with certain failings and faults, not much to be wondered at when his religious education, his eventful times, the depravity of many of the parties with whom he came in contact, and the remarkable scenes of his varied actions, both as a fugitive and a conqueror, are adverted to; and his journal, though it occasionally notices matters neither of personal nor general interest, throws a flood of light on the peculiar habits and conduct "of the founder of a new dynasty, in one of the richest and most powerful empires on earth," and the natural and social state of the various countries, particularly India, which he visited in the progress of his extensive military operations and civil administration. "Perhaps no work ever composed," as remarked by Mr. Erskine himself, "introduces us so completely to the Court and Council, the public and private life, of an Eastern Sultan." It is not at all improbable that had not Mr. Erskine, with marvellous zeal and application, followed up the labours on it of his early companion in study Dr. Leyden, it would have remained to this day unknown to Europeans. It is now so much and justly valued, that it is with difficulty that a copy of it can be procured. The estimate formed of Baber's character by Mr. Erskine, and which he sums up in chaste and classical style, has been assented to by all subsequent writers on Indian history.

Mr. Erskine joined the Royal Asiatic Society, on its foundation, after he had proceeded to Europe. He became, also, a member of the Committee of the Oriental Translation Fund. To these institutions, however, he made no contributions. Several articles on India, which appeared in some of the home periodicals, were attributed to his pen.

Mr. Erskine spent the last years of his life principally in Edinburgh, and at Bonn, on the Rhine. They were devoted to studies quite congenial with his former literary occupations—to the elucidation, from original sources, of the early Muhammadan history of India; but though he was on the verge of his eightieth year when he died, he was not spared to lay the results of them before the public. The intelligence of his death, on the 28th May, arrived in India by the last mail. It may be safely said of him, without detracting from the meritorious services of others, that this Society owes as much to his exertions,

as one of its most active office-bearers and learned contributors, as to those of any other of its members. None of his early contemporaries in India, known to the literary world, now remain. Many of them were men of distinction, who will not soon be forgotten. Sir James Mackintosh, though he never entered deeply into Oriental research, was, perhaps, next to Jeffrey, the most accomplished critic of the day, a proficient in mental and ethical science, and one of the richest and most eloquent of writers and speakers. Jonathan Duncan, the Governor of Bombay, in spite of his "Brahmanized mind,"—facetiously alluded to by Sir James,—never lost the happy sympathies of the West, as well evinced by his zealous exertions for the abolition of infanticide. He was an excellent Persian and Hindustáni scholar, intimately acquainted with the manners and customs of the natives, and gave some short communications to the Bengal Asiatic Society before he came to our Presidency. Lord Valentia and Mr. Salt established a high character for their extensive travels, voyages, and researches in India, Abyssinia, and Egypt; and to them we ourselves are indebted for our first respectable and trustworthy notices of the excavations of Kárlá and Salsette. Dr. Helenus Scott, a member of the Medical Board, is not unknown to chemical science. Colonel Boden became the founder of the Sanskrit Professorship in Oxford, which is so effectually revealing the ancient literature and history of India to England. Dr. Robert Drummond published grammars of the Malabár, and Maráthí and Gujarátí languages, from which important gleanings may yet be made by the best of our local philologists. Major Edward Moore published an interesting history of Lieutenant Little's Detachment, a work on Hindu Infanticide, Oriental Gleanings, and the well-known work on the Hindu Pantheon, which, notwithstanding its "Duncanese style,"—for so the compositions of its author have been characterized,—can scarcely now be procured for its original price of five guineas. Sir Jasper Nicholls was our first writer on the meteorology of Bombay. Mr. Francis Wrede and Lieut. Frissell were among the earliest contributors to the Society, the latter furnishing a curious article on Persian ethics. Mr. Robert Steuart, a respectable antiquarian, was one of the first writers on the Sauráshtrian coins. Colonel Alexander Walker's reports on Infanticide and the various districts of Káthiáwar, which were "settled" by him, are among the most interesting documents connected with the public services in India. Major David Price's works on Muhammadan history, and other Oriental matters, are standard authorities. It was in the view of the services rendered to Oriental literature by these distinguished men, that the address was presented to Mr. Erskine on his leaving India which has been already quoted. This may show to us, their successors of

what, adverting to the changes of Indian Society, may be denominated the third generation,—for our Malcolms, and Kennedys, and Elphinstones, and Sykeses, and Briggses, and Romers, intervene between their day and ours,—the peculiar value of Mr. Erskine's services and labours. Let us feel and do justice to the encouragement and stimulus of his worthy example.

ART. VI.—*The late Professor* EUGENE BURNOUF, *of Paris, and his Oriental Publications.*

THIS most distinguished Orientalist, an Honorary Member of our Society, a most valued correspondent of most of our Eastern scholars, and the instructor of them all by his great and important works, died at Paris, on the 29th of May last. Asia, as well as Europe, mourns his loss. We have a melancholy satisfaction in transferring the following notices of him and his various publications to the pages of our Journal, from *Le Moniteur Officiel des Etablissements Français dans l'Inde* :—

"MONSIEUR LE REDACTEUR,—Sous le titre de *Nécrologie* et à la date du 29 mai dernier, le numéro du *Siècle* du 30 du même mois contient ce qui suit:

"'L'Académie des inscriptions et belles-lettres vient de faire une nouvelle et grande perte. M. Eugène Burnouf, que ses collegues avaient, il y a peu de jours, appelé à remplacer dans les fonctions de secrétaire perpetuel M. Walckenaër, mort tout recemment, est décédé hier à la suite d'une longue et cruelle maladie, âgé de 50 ans à peine. Fils d'un philosophe éminent que l'Académie a compté aussi parmi ses membres, Eugène Burnouf s'était depuis longtemps placé, par de nombreux travaux et de remarquables découvertes, au premier rang des orientalistes. Il était professeur de langue et de littérature sanskrites au Collége de France, et inspecteur général de l'enseignement supérieur. En apprenant la triste nouvelle de sa mort, sur la proposition de M. Guizot, l'Académie, qui tenait sa séance hebdomadaire, s'est immédiatement séparée.'

"Le seul journal français publié dans l'Inde, pays qui n'a cessé d'être, pendant toute la vie de M. Eugène Burnouf, l'objet de ses predilections et de ses investigations devouées, ne pouvait passer sous silence un si douloureux evènement. Permettez-moi de le signaler comme ayant sans doute échappé à votre connaissance, et d'ajouter quelques lignes à celles que je viens de citer. M. Eugène Burnouf, d'ailleurs, était non seulement, comme Silvestre de Sacy, Champollion le jeune, et Abel Remusat, une des gloires intellectuelles de la France, une illustration unanimement saluée partout où ont pénétré les études philologiques et asiatiques; mais en outre, il n'était pas tout a fait un étranger pour Pondichery: plus d'un, parmi nous, a eu l'honneur, a diverses époques et a differents titres, de l'approcher et de le connaître, et c'est l'un motif

de plus pour que son indigne élève ose venir appeler un instant sur sa mémoire l'attention de vos lecteurs.

"Je ne saurais mieux faire connaître la portée, l'esprit general et le developpement successif des trauvaux considérables de M. Eugène Burnouf qu'en reproduisant, de l'article *Orientalistes* inséré en 1842 dans l'*Encyclopédie nouvelle*, les passages ci-après, ecrits, j'ai tout lieu de le croire, sur ses indications mêmes :

"'Elève de Chézy, il étudia le sanskrit, et après avoir appris cette langue, il voulut savoir ce qu'elle était dans le temps et dans l'espace; il étudia alors le pali, et se convainquit que cet idiôme, cultivé a Ceylan et dans l'Indo-Chine, etait un italien du sanskrit, et que par suite le pali avait été porté de l'Inde dans l'Indo-Chine, et cela lors de l'invasion du Buddhisme dans ce pays. Puis, après avoir constaté l'antériorité du sanskrit sur les langues parlées a l'est de l'Hindoustan, il rechercha si le sanskrit etait également posterieur ou bien anterieur aux langues parlées au nord-ouest de l'Hindoustan, dans ces vieilles contrées de l'Arie et de la Bactriane. Le resultat de ces recherches fut que le zend, la langue antique de l'Asie, est congenère du sanskrit classique, mais plus ancien ; que le sanskrit presente déja de nombreuses traces d'une culture plus avancée ; que le zend lui-même présente aussi, en moins grande quantité, il est vrai, quelques alterations, que des lors on doit les regarder comme deux langues derivant d'une même source, inconnue et sans doute perdue à jamais. Un autre résultat de ces recherches philologiques fut la publication du *Commentaire sur le Yaçna*, et la création de l'étude de la langue zende. Il devint dès lors constaté que le plateau arien avait été le point de départ de deux courants : l'un arien-brahmanique, qui a couvert l'Inde et, par le Buddhisme, l'Asie oriental ; l'autre, arien-bactrien, qui a enfanté les diverses civilisations de l'Asie occidentale et de l'Europe. Continuant ses importantes recherches, après avoir constaté ce qu'était le sanskrit dans l'espace, après lui avoir fixé pour théâtre l'Hindoustan, M. Burnouf a voulu savoir ce qu'était, dans le temps, la civilisation dont la langue sanskrite était l'expression. Il a publié alors le *Bhâgavata Purâna*, afin de faire connaître les généalogies (livre IX) qui, comparées avec celles des autres Purânas, et les traditions épiques du Mahâbhârata, donneront les seuls renseignements historiques que l'on puisse vraisemblablement obtenir des livres sanskrits. Puis enfin, après avoir précisé la question sur le sanskrit et le vrai rôle de la civilisation hindoue, venue du nord de l'Inde, conquérant le sud de la presqu'île, et débordant sur l'Indo-Chine, il a voulu compléter ses études sur le Buddhisme, c'est à-dire sur le courant religieux de l'Asie orientale.

* * * * *

"'Nous ne craignons pas de dire à l'avance que la publication que prepare en ce moment M. Eugène Burnouf jettera bien des clartés sur cette importante question de l'histoire des religions. Cette publication se compose :

"'1° D'une traduction du *Lotus de la bonne loi*, contenant plusieurs paraboles d'un caractère presque évangélique sur les principaux dogmes du Buddhisme ; on y voit le Buddhisme triomphant et développé ;

"'2° D'une analyse des livres qui composent la collection des manuscrits envoyés du Népâl ; plusieurs sont évidemment des premiers temps du Buddhisme, et sont d'autant plus curieux à connaître qu'ils montrent bien l'origine toute brahmanique du Buddhisme et son caractère de reforme ;

"'3° Enfin, d'une histoire du Buddhisme.'

"En 1844 parut le premier volume de *l'Introduction à l'histoire du Buddhisme indien :* On y trouve l'exposé le plus complet des origines et des doctrines de cette religion curieuse qu'il soit possible d'obtenir actuellement, en présence de l'immense étendue des écritures sacrées des Buddhists, composées de quelques centaines de volumes in folio. Bientôt après, l'auteur, ne cessant de poursuivre la synthèse de ses savantes recherches, et voulant faire pour le Buddhisme du sud ce qu'il avait fait pour celui du nord, reconnut la nécessité d'entreprendre l'étude de la langue barmane, qui devait lui permettre de contrôler l'ancien texte pali de Buddha par la version moderne. Il aprobablement laissé inachevé l'ouvrage ou ce *tour de force* (il considerait ainsi son projet) aurait eu sa place ; et, jusqu'à ce que les connaissances si variées et si larges qu'il reunissait se presentent de nouveau chez un même homme, demeurera ajournée une comparison digne du plus puissant interêt.

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ment supérieur, et, pendant la maladie à laquelle il à succombé, ses collègues de l'Académie des inscriptions l'avaient choisi pour secrétaire perpétuel. Sur sa tombe sera gravé ce titre inappréciable, qui rappelle les hautes traditions, les grandes renommées de l'érudition française.

"La science a dévoré les jours de celui dont elle avait de bonne heure fait couronner le mérite. Le nom d'Eugène Burnouf ne perira pas: puisse sa nombreuse famille y trouver une consolation.

"Agréez, etc. "ED. ARIEL.

"P. S.—Un ami m'envoie, au moment où je termine, le numéro du *Journal des Debats* qui renferme le compte rendu des obsèques de M. Burnouf. L'hommage des regrets les mieux sémis, de l'admiration la plus vive, et de l'affection la plus vraie, a été déposé au bord de la fosse, au milieu d'un nombreux et imposant cortége, qui montrait assez combien la perte faite, était considérable et justement comprise. M. Natalis de Wailly, au nom de l'Institut, M. Barthélemy Saint-Hilaire, au nom du Collége de France, et M. Guigniaut, au nom de l'Université de la famille et des amis de M. Burnouf, ont successivement parlé. Ils ont dit qu'à ses derniers instants, il avait pu connaître le suffrage unanime par lequel 'l'Académie, soigneuse de sa propre gloire,' lui avait décerné la dignité de secrétaire perpétuel et qu'il 'aurait abandonné, pour cette dignité qui comblait toute son ambition, les hautes fonctions dont il venait d'être investi par le Gouvernement, préférant ainsi aux interêts de sa propre famille, qu'il aimait pourtant d'un amour infini, la science, à laquelle depuis longtemps, et sans le savoir peut-être, il avait sacrifié chaque jour sa santé et sa vie;'—que le 'philologue de genie,' comme l'appelait la voix respectée de M. Villemain, vivrait 'de cette immortalité qui est promise aux grands travaux de l'intelligence qui leur suffit;' que 'la philologie française, honorée déjà par tant d'illustrations, n'aura rien produit de plus grand que lui;'—qu'il avait terminé son *Histoire du Buddhisme* quand son mal s'était déclaré il y avait trois mois, et que ses forces s'étaient 'usées dans la rédaction et l'impression du second volume de ce grand ouvrage' philologique, historique et philosophique, où il lui fut donné de 'réunir, dans une harmonie suprême, ces trois caractères de la veritable et complète érudition.'

"Il est impossible de rien ajoûter a ces éloquens témoignages.

"E. A."

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